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JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 5 1959

SECOND WORLD CONFERENCE ON MEDICAL EDUCATION

MEDICINE—A LIFELONG STUDY

PRESIDENTIAL ADDRESS AT THE W.M.A. CONFERENCE ON MEDICAL EDUCATION, CHICAGO, AUGUST 29 – SEPTEMBER 4, 1959

BY

RAYMOND B. ALLEN, M.D.

Chancellor, University of California at Los Angeles, U.S.A.

I am proud to have the honour of welcoming you to this great conference on medical education and of saluting you for your dedication to the profession of medicine and to medical education. Ours is a great international fraternity of men and women devoted to the health, welfare, and happiness of people everywhere. Medical education attracts idealistic members of the profession who are concerned about the transmission of the science and the art of the practice of medicine. They cherish the great and rapidly increasing body of knowledge and skills of medicine. They transmit all of this to the young and inculcate in them the ideals and the spirit of service which imbues our great profession.

And so may I express your gratitude and mine to the World Medical Association, its officers and Council, for organizing and planning this Second World Conference on Medical Education. That such a Conference would be held was inevitable after the great success of the First World Conference in London in 1953. The impact of the proceedings of that meeting on undergraduate medical education is well known. The success of this one is assured by the meticulous planning of the programme committee, and by the distinguished group of leaders in medical educational thought and practice here assembled. You have come from the great medical centres of the world to exchange experiences and ideas about the art of educating and training the physician. Modern technology, it is true, is shrinking distances and making peoples everywhere close neighbours. Even so, your presence here represents sacrifices from your obligations at home, and your colleagues here in America are most grateful for the time you will be spending among us. We do hope that while you are in our country you will spend more than this week with us and visit far and wide.

All of us are indebted as well to the World Health Organization, the Council for International Organizations of Medical Sciences, the International Association of Universities, our host organizations, the American Medical Association, and the Association of American Medical Colleges, and to many foundations, corporations, and associations, as well as to individuals who have helped to make our meeting possible.

We are proud indeed that the President of the United States has honoured the Conference with his sponsorship.

If you will permit this personal note, may I say that as I have worked with Dr. Louis Bauer, a most distinguished physician and the Secretary-General of the World Medical Association, I have appreciated his great skill as an organizer and leader. Learned, humble, sensitive, wise, he is at the same time decisive (as those of you who have attended meetings of the World Medical Association know full well). His selfless dedication to the best interests of mankind through our profession and medical education is an inspiration to us all.

We are here to think together about the problems of medical education and learning which continue throughout the professional lifetime of the physician. Our concern will be with the ways in which the physician may best and most expeditiously extend his knowledge and improve his skills; with the health problems of the community of which he is such an important part; and with the preparation of medical teachers and research scientists.

A Period of Crisis

Never, perhaps, has a conference been convened at a time of greater ferment. Perhaps it is not too much to say that this is a period of crisis. I refer to the crisis of the adaptation of science and technology to the problems of the revolution of rising expectations of people everywhere. Information on the advances in science and technology is known world-wide, almost as soon as they occur. Never has a challenge been more immediate; never has the demand for the benefits of science and technology been greater; and never have the problems of medical education and medical service been more urgent. Thus, we meet at a time when our deliberations are world news and our findings and recommendations are eagerly awaited—awaited not merely by our colleagues at home in the profession, but by peoples generally and by their governments.

Governments everywhere, and in whatever form, are increasingly aware of their responsibilities to their people. Edmund Burke emphasized this relationship, in eloquent words that are meaningful to-day, when he said: "Society is indeed a contract. . . . But the state ought not to be considered as nothing better than a partnership . . . to be taken up for a little temporary interest, and to be dissolved by the fancy of the parties . . . it is a partnership in all science; a partnership in every virtue, and in all perfection. And as the ends of such a partnership cannot be obtained in many generations, it becomes a partnership not only between

those who are living, but between those who are living, those who are dead, and those who are to be born."

But it is not my purpose to discuss government in relation to the problems of medical care. This is not the subject of our conference. However, may I say that to the extent that governments impose regulations on the medical profession that interfere with personal professional service, and regulate medical education in the interest of the political institutions of government—to this extent, the freedom of the individual doctor and professor is impaired. At the same time, medical men have come to appreciate that there are many things which the State can do more effectively in certain aspects of preventive medicine, public health, and medical service. Governments everywhere are in the business of providing hospital services, for example, and this is as true in the United States as elsewhere. The great problems of the mentally ill, of infectious disease and tuberculosis, of mounting populations, and of food and nutrition, and medical services for the armed Forces and Veterans, require community and State action. Without this community contribution of facilities and services the individual physician and the profession as a whole could not render their most effective service. In a sense, the State, with the co-operation of physicians, deals with broad environmental problems and organizes facilities within which the profession can provide its independent and essential professional services. Accepted, too, is the fact that the State must exercise a licensing function of physicians and health service personnel. The State, together with the universities and medical schools, guarantees to the public that the medical graduate is qualified to practise medicine, assuming personal responsibility for the health of the individual.

But the medical profession, this Conference of the World Medical Association, our national and local associations, and the individual physician himself, must be constantly alert lest the independence of the practising physician or health officer be restricted in his relationship with his patients. The fact that we meet in national and international conferences, publish papers, and communicate with one another on these vital questions without interference by government augurs well for the future and the solution of the problems we will be considering. As long as we, as individuals, are aware of our responsibilities and exercise them with judgment and humility, seeking only the welfare of our fellow human beings, we have nothing to fear for the future of our profession.

Increasing Demand for Medical Service

There are problems, of course, and one of them about which we will be talking is the demand for more medical service, particularly among peoples where facilities are inadequate for training physicians and health personnel in sufficient numbers to meet the needs of the community. Even in the United States, where there is one physician for every 750 people, a recent report to the Secretary of Health, Education, and Welfare indicated that a minimum of 14 new medical schools should be built by 1970 to meet the requirements of medical service to a growing population and expanding economy.

I learned in Indonesia recently that over the next ten years the number of graduates will be greatly increased and that one physician to 10,000 people, with auxiliary personnel, will be able to meet the health needs of the country. The co-operation of international technical assistance agencies with the universities of Indonesia in this programme is an example of world-wide efforts to meet the health service needs of people.

I am convinced that this Conference and co-operating governments and organizations can mobilize a tremendous reserve of resources to meet the rising expectations for a healthful, decent existence. The international health year of 1960, presently being proposed and organized, will be a year of massive mobilization of all organizations towards these high goals. We will co-operate fully with officers of government, officers of the World Health Organization, and the United Nations, and will bend our own individual efforts toward doing what we see in front of us to do, whatever the sacrifice.

Medicine, an Influence for Good

More than 30 years ago one physician made up his mind that he could best serve his fellow men by leaving his honoured place in Europe, where he was esteemed as a theologian, composer, philosopher, and author, and by establishing a modest hospital in the jungle village of Lamborene, in French Equatorial Africa. He still labours there with help from his many friends and admirers the world around to bring modern medicine to the people he serves. I like to tell my friends in this country that he, Albert Schweitzer, was a pioneer international co-operation administrator, and an ornament of our profession. There are many Albert Schweitzers of medicine. In your own way, each of you is practising this same faith—faith in the individual, and faith in yourself and your God.

As we learn to respect ourselves, we learn to respect all life, and especially human life. Out of disregard for human life has grown the crisis and struggle of our times. Unhappily, many people seek only to gratify their own selfish acquisitive instincts. What a tragedy this is when there is enough for everyone's need, but, as someone has remarked, not enough for everyone's greed. The physician, like the philosopher and the saint, puts down this sorry scheme of things as man's baser nature, and with patience, kindliness, and tolerance goes about his work of healing, and prays that time will not run out.

As we look back across the cataclysmic years of man's struggle and despair, we are challenged to see to it that, centuries hence, man will look back and say of us that we built upon the best that was in us and fashioned a better world for them. Medicine, with its age-old concern for the sick, the poor as well as the rich, the weak as well as the strong, has been an influence for good, surpassed only by the moral precepts of religion. The services of medicine, like those of religion, are, and will continue to be, largely personal. However, medicine must progress as a social as well as a biological science, and must broaden its outlook accordingly.

The timeless quest of medicine is health—health not merely of the individual, but of the society that embraces him. Medicine has learned that these goals are actually one and inseparable. Healthy individuals in a healthy society are interdependent for their security and well-being. Unhealthiness in one leads to unhealthiness in

the others. The quest of health is timeless, but with ever-changing frontiers. The outcome of the search depends upon the imagination, energy, skills, and courage of individuals, and especially of university and medical school men, men of "hope and forward-looking mind."

Relation of Medicine to Education

Now may I say a word about the relation of medicine to the university as a whole and to education in general. All of us have seen patients who are sick yet have no evidence of organic disease. We have seen sickness of the spirit of man, sickness of the soul. We have seen patients who are sick because they have given up the battle, because they were incapable of dealing with the problems confronting them. But it is rare indeed that we have seen a sickness of spirit in a man who has prepared himself well for the kind of world in which he is living. The tragic pity is that many people never have the opportunity to prepare themselves to cope with the problems of the kind of a world which is now emerging—a world of science, technology, and industry; and so we see many neuroses, many psychosomatic disorders for which the cure is difficult because re-education is difficult, especially when there has been little education to begin with.

An important element in the revolution of rising expectations is the expectation of every parent that his children will have the advantages of an education. It is clear enough to even the lowliest of men that if his children are to progress and have a better life in an age of science and technology, they must have all the education and training possible. The curiosity, imagination, and great energies of the young need only to be provided with a healthy outlet—serious study, work, and activity, mental and physical and spiritual, which lead them on to better appreciation of themselves, hopefully to full self-realization. Thus the young learn that disciplined well-schooled intelligence is the way to excellence and that through excellence comes self-realization and understanding of themselves and their fellow men. In this manner they grow to maturity and to leadership in a world which will belong to those who are prepared to manage it.

Education and health are inseparably bound together, for unless the mind is trained to think, to create, to work, to try and fail, and try again and again to achieve, nothing results but a boring routine and no self-realization and no real happiness. Happiness is found only in self-realization, and it is through the mind, nourished by the healthy food of great ideas and great works and great achievements of mind and hand and spirit, that the individual comes to understand and realize himself—who he is and what he can do. This, I suggest, is the binding relation of medicine and education, not merely education of the doctor, but education of men.

The physician humanizes science. He brings to science human understanding and warmth, drawing from the rich traditions of his noble art, from all the ages and races of men. Selfless, dedicated, wise, and strong, his is a profession which seeks to embrace the wisdom of the race, the wisdom of the sciences, and the arts in the service of human kind. The physician of the future is our sacred trust. He will cushion the hammer blows of cold science and technology and of powerful government, and will help bring to this age peace and good will among men everywhere.

In this Conference, ladies and gentlemen, we rededicate ourselves to this great mission of education, joining hands with men of good will in every profession and in government to make a great crusade for the health and welfare of every living soul on this planet. In spite of the many divergent forms of government in this world and of tensions and differences among governments, this bond among men and peoples, though sometimes strained and bent, is never broken.

THE PROCEEDINGS OF THE FIRST WORLD CONFERENCE ON MEDICAL EDUCATION*

BY

WILLIAM MELVILLE ARNOTT, T.D., M.D., B.Sc., F.R.C.P., F.R.C.P.Ed., F.R.C.P.C.

William Withering Professor of Medicine in the University of Birmingham

"Medicine to-day demands much from character, intellect, and practical ability, and medicine also provides a wide variety of opportunity for all kinds of talent. But talents will be wasted or misused if the structure and content of medical education are faulty, and if medical educationists remain complacently satisfied with themselves and their methods." With these apt words Sir Lionel Whitby concluded his presidential address to the First World Conference in London in 1953. It is with a deep sense of humility and sorrow that I stand before you, because I know that but for his untimely death Sir Lionel would be in my place and I would not have lost a kind friend and we an inspiring leader.

By a happy inspiration Sir Richard Livingstone, a former President of Corpus Christi College, Oxford, in an address to the Opening Plenary Session struck the keynote of the whole conference when he expounded the philosophy of the first-rate in the sense that the hall-mark of the educated man is that he knows what is first-rate and "that the best-educated man is he who knows the first-rate in the most important human activities." If the development of such critical appreciation of the first-rate in medicine is the objective of undergraduate education surely the theme of this Second World Conference devoted to graduate education must be the maintenance and sharpening of the same faculty throughout professional life.

The First Conference was attended by over 600 men and women representing 127 faculties and 62 countries. Apart from the Plenary Sessions 87 papers were delivered, and the published proceedings amount to 800 pages containing just short of half a million words.

The work of the Conference was divided into four sections: Section A, Requirements for Entry into Medical Schools (chairman, Dr. Victor Johnson;

*An address given to the Second World Conference on Medical Education, Chicago, 1959.

rapporteur, Dr. Raymond Whitehead); Section B, Aims and Content of the Medical Curriculum (chairman, Sir Arcot Mudaliar; rapporteur, Dr. Morgan Jones); Section C, Techniques and Methods of Medical Education (chairman, Professor Alberto Hurtado; rapporteur, Professor Ian Aird); and Section D, Preventive and Social Medicine (chairman, Professor A. Stampar; rapporteur, Dr. Charles Fletcher).

A. Requirements for Entry into Medical Schools

The first group of papers were concerned with the general educational background of the prospective medical student. While everybody was agreed that this background should be broad, there soon emerged the usual controversy on the part which should be played by the classical tradition based on Greco-Roman studies, philosophy, and history on the one hand, and on the other by a scientific foundation with emphasis on mathematics, physics, chemistry, and biology. The one fact that soon emerged was that an educational programme which would reconcile all these varied views would occupy the average student far into adult life and would leave him, at best, fit only to compete on a TV general knowledge quiz and at worst would make him completely refractory to all further educational stimulus. Although perhaps not expressed in so many words there was a general realization that the business of doctoring had in it such a large content of chemistry, physics, and biology, much of it quantitative, that for most students a substantial foundation of these subjects had to be laid at the high school or gymnasium stage. At the same time, while such might be the path of the majority, provision should be made for the acceptance for medicine of a minority who had shown brilliance in purely classical studies. The innate ability of these would enable them to acquire quickly the necessary grounding in science subjects and to overtake the generality. It was pointed out that the inculcation of a cultural background was not the exclusive perquisite of classical studies, but that, properly taught, science could be an intensely humanizing experience as well as a basis for sound doctoring.

A great deal of time was devoted to considering the criteria for selection of medical students. It emerged that in some countries devotion to the principle of "the equality of man" excluded any discrimination whatever. All who bore the prescribed educational hall-mark were admitted. This practice results in enormous classes in the early years with a very high failure rate. All this leads inevitably to serious impairment of teaching efficiency during the early years, with loss of time and frustration of those who are rejected. Although meant to be kind, this indiscriminate egalitarianism can be cruel.

At the same time, while the majority were clearly against mass acceptance there was considerable divergence of opinion as to how best to effect a satisfactory selection. It did seem clear, however, that, while a high standard of performance in the subjects of general education was a useful guide, a careful and skilfully conducted interview was a great help in assessing the important qualities of bearing and character. Contrasting opinions were expressed on the value of psychological tests, although it was, I think, widely agreed that these procedures would become valuable with constant use and systematic correlation of performance with prediction.

It was obviously an advantage to be able to select on the basis of individual worth alone without consideration of the extent to which the applicant's family was able to contribute financial support.

In summing up, Dr. Whitehead made a very eloquent plea that we all remember that students were merely ourselves when young and not to expect too much of them. Professor Samson Wright was quoted as having whimsically described the ideal medical student as "tall, handsome, of great personal integrity, beautifully mannered, cultured, highly intelligent, a tireless worker, original, good with his hands, skilful in exposition, a good mixer, athletic, devoting his spare time to extramural activities, with a good family background, and so on and so forth"—a dazzling Olympian but certainly not to be found amongst men.

B. Aims and Content of the Medical Curriculum

In this section many speakers emphasized the importance of the university ideal in which emphasis is not on training and instruction in the sense of didactic teaching, but to help the student to acquire outlooks and habits of scholarship, to develop his critical faculties to the utmost, and, above all, to be fired with curiosity to know, to find out, and to add to the total of human knowledge.

There was widespread acceptance of the concept that the duty of the medical school was not to produce a general practitioner any more than a surgeon or a hygienist, etc., but the much simpler and more attainable one of advancing the education of the doctor to the point from which he can, within a reasonable period, be turned into a useful general practitioner or, if he be possessed of the required industry, enthusiasm, or ability, can aspire to one or other of the more exacting specialties for which a period of approximately 10 years' postgraduate training is required. Thus formal qualification is merely the end of the beginning, not an end in itself.

There was frequent use of the blessed word "integration," by which was clearly meant the presentation of a single corpus of knowledge concerned with the health of man. The conventional divisions of medical science into anatomy, physiology, pathology, etc., are to some extent accidents of evolution rather than fundamental in nature, while the subdivisions of clinical practice depend more on historical trends, technical skills, and circumstances of the market place rather than on basic belief.

The importance of introducing an appreciation of statistical mathematics at an early stage was emphasized. Not that it is necessary for the student to become proficient in the arithmetic callisthenics of statistics, but rather to develop a sound philosophy of numerical data. All medical men should have some idea of when data can be usefully compared, the magnitude of error in observation, of the significance of differences, and, above all, that significant numerical correlation does not necessarily imply causal relationship. A doctor must also be familiar with the conventional methods of expressing vital statistics. Much of the opposition to statistics in medicine springs from its power to unmask the falsehood which underlies the careless observation, muddled thinking, and pompous assertion which still bulks so largely in current belief.

A very interesting communication dealt with the teaching of medicine and surgery as a single discipline. This has obviously much to commend it, and a useful preliminary to this which works well in my own hospital is the retention in medical wards of patients in whom surgical treatment becomes necessary. This brings together easily and naturally surgeons and physicians, to their great mutual advantage, and the student does not fall into the error of thinking that there is surgical dyspepsia as distinct from medical dyspepsia, or that the physician and surgeon are rivals for, not partners in, the care of such disorders as thyrotoxicosis.

Many speakers expressed the view that topographical anatomy was overemphasized and that undue devotion to dissecting the whole body was undesirable. Anatomists and physiologists presented stimulating accounts of how they had attempted with considerable success to combine the presentation of their subjects and to link them closely with clinical practice.

Expressed broadly and yet succinctly, it seemed to me that Section B considered that the aim of the curriculum was to lay a secure foundation of critical knowledge of human biology and on this to build a concept of clinical practice as an applied science. Parallel with this must go the development of the no less essential qualities of compassion and selfless devotion to the sick—ethics which cannot be taught by precept but only by the example of those devoted to these ideals.

C. Techniques and Methods of Medical Education

Much of the work of this section was inevitably and quite properly a more detailed consideration of the broad aims outlined in Section B. The great value of this became apparent at the final plenary session and is fully realized when one studies the *Proceedings*. There was a highly diverting and somewhat controversial discussion on the place of the strictly whole-time clinical teacher. It was clear that in this problem much depended on the national background. In Britain, where a very high proportion of patients are treated in State hospitals and in which whole-time as well as part-time teachers enjoy similar facilities, deal with the same social range of patients, and, to some extent, see patients in their homes (without of course receiving a fee personally), the distinction between the two categories has become virtually insignificant. It was, however, widely agreed that the student should be taught by both varieties of teacher—indeed, that each was complementary to the other. Personally, I am in the strongest possible agreement with this viewpoint.

The systematic lecture came in for some heavy criticism. Didactic rather than Socratic teaching, large classes, crowded ward rounds, overemphasis on theoretical lectures, lack of contact between staff and students, excessive reliance on textbooks, and examinations which test memory more than reasoning are all to be avoided in education for medicine. There seemed little doubt that most people appreciated the importance of clinical education by practice and example. The incorporation of the student into the team concerned with patient-care and his presence throughout the vicissitudes of a wide variety of incidents of illness is of prime importance.

Claims were made for teaching in the policlinic, in the home, in the laboratory, etc., but I gathered the impression that any place was suitable provided the teachers were keen and capable and that they were dealing with real live problems of health and disease. The opinion was expressed that the extent to which the various specialties of clinical practice and types of disease were emphasized in the curriculum should bear a quantitative relation to the frequency with which they were encountered in daily life. This was countered, and I think rightly so, by the opinion that subjects should have a degree of importance attached to them dependent on their scientific sophistication. Thus emphasis on cardiovascular disease and neurology would rightly be educationally advantageous.

D. Preventive and Social Medicine

In many ways this was the liveliest and most productive section of the Conference. A perusal of the record leaves no doubt that good doctoring entails a proper appreciation of the environment in relation to health and disease. The many excellent papers effectively dispelled any lingering doubts as to any undesirable political implication of the term "social medicine" while at the same time making it abundantly clear that the effective promotion of health and the adequate provision of medical and material aid for the sick and their families is an essential feature of any well-ordered community. Whether this be provided by the State or by efficient private enterprise seems largely irrelevant and a matter that can be left to the inclinations of each nation. The essential thing is that it shall be provided. It was emphasized that while the principles of preventive and social medicine should imbue all clinical teaching, these subjects constituted academic disciplines in their own right and that a medical school needs specialists in the various aspects of the subject.

Conclusion

You will realize that because of my own inadequacy and the strict limitation of time necessarily imposed on me this is a ludicrously inadequate survey of the First Conference. I have been viewing it at a reduction factor of approximately 1 in 250 with an optical system which visualized only what I want to see but which I hope is free from chromatic aberration.

In conclusion I wish to emphasize one consideration which seems to me of paramount importance in the lifelong study of medicine and which was implicit in much of the work of the First Conference. The lifelong maintenance of a high standard of informed, critical, and conscientious practice depends more than anything else on the avoidance of professional isolation. Where doctors are continuously subject to the kindly mutual criticism and approbation of their peers it becomes difficult for them to allow their standards to slip and their minds to crystallize. The circumstance that teaching hospitals are, in general, the best hospitals, that medical teachers constitute in the main the leaders of our profession, is not only due to careful initial selection but to the fact that the teachers work constantly in the fierce light of the critical appraisal of their colleagues and even more so of their students. Whether they like it or not, they are set on a pedestal which can so easily become a pillory. I hope, therefore, that full attention will be paid to the promotion of professional association, which is much more important than formal refresher courses. This is particularly important for family doctors. I hope also that we will face squarely the fact that it can easily happen that a system of remuneration can minimize such association

by tending to make practitioners commercial rivals rather than professional brethren. Where such occurs everything possible must be done to overcome such influence.

The widely scattered doctors of the less-well-developed territories are also a problem. It so happens that in the last two years I have travelled nearly 40,000 miles in three long medical tours in British Africa, mostly equatorial Africa, so that I might learn something of the outlook of doctors there and perhaps give them something of my outlook. The circumstances of these lands present formidable difficulties, but I will close by quoting the motto of my University of Birmingham, "Per ardua ad alta."

CONCLUSIONS AND RESULTS OF THE FIRST WORLD CONFERENCE ON MEDICAL EDUCATION*

BY

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I have circularized the 400 medical teachers who attended the First World Conference on Medical Education, and received about 100 answers. About 20 of my correspondents replied that they had learned nothing anew at the Conference, and the Conference had consequently had no effect on their teaching methods or on the medical curriculum in their medical schools.

Appreciation of the Conference

The great majority of the answers, however, expressed very strong appreciation of the Conference itself, and the value of the opportunity of informal conversation with delegates from other medical schools and other countries was frequently stressed. It must be confessed that a majority of the correspondents could not single out any particular alteration in method of teaching or in content of medical course, but a majority believed that the Conference was responsible for a freshening revival of educational ideals. Most delegates do seem to have been stimulated to renew their own positive thinking about educational aims and methods.

On the positive side, it is quite clear that the published *Proceedings* of the First Conference were of very great value to those responsible for new medical schools that have been brought to birth in the last few years. Delegates from six important countries have been able to report that the *Proceedings* have been closely studied by the authorities responsible for drawing up the curricula in new universities. In two other countries, Germany and Chile, the curriculum of medical schools has been recently reviewed, and the delegates from these countries to the Conference have reported that due and detailed consideration was given by the replanning authorities to the *Proceedings* of the First World Conference. In Britain the General Medical Council has recently brought forward recommendations for improvement in the curricula of medical schools, and a study of these recommendations shows that many ideas expressed in these recommendations are in close parallel with deliberations at the First World Conference. It seems clear that the *Proceedings* of the First World Conference are likely for some considerable time to exercise an important influence on the intellectual architects of new medical schools.

In general the ancient medical schools of wealthier highly industrialized countries have been disinclined to alter their established curricula and teaching methods. Delegates from these medical schools, reporting their conservatism, have reacted to the conservatism in different ways. Some of the delegates have been convinced by the Conference that the methods of their own school cannot be bettered, and in a great many instances one is forced to concur with this view. Some other delegates from such schools, however, have returned home after the Conference with a fervid ambition to make important alterations in teaching programmes and methods, but have failed to enlist the support of those colleagues who had not attended the Conference. It seems probable that the Conference in fact attracted men who already felt that the medical course in their own schools, as in other schools, was still imperfect.

The Conference does seem to have been most appreciated by delegates from less wealthy and less highly industrialized countries, and the effect seems to have been greatest in the medical schools of these countries. Even so, however, delegates from these countries are those who in writing to me have shown the greatest frustration. Returning to their countries imbued with new ideas from the Conference, they have been balked in their ambitions and in their enthusiasm by the poverty of their countries' educational budgets. A very striking antithesis has emerged in this correspondence between the inertia of intellectual self-satisfaction that has assailed delegates returning from the First Conference to old medical schools in highly industrialized countries, and the economic inertia which has balked candidates returning to less highly industrialized countries.

Frequent praise is directed, however, to the success which the Conference had in a restatement of the aims and ideals of medical education, and it is clear that most delegates returned from it spiritually refreshed.

The Curriculum

Some delegates took back to their universities the agreement of the Conference that, in a consideration of requirements for entry, due weight be attached to a broad general education and adequate consideration be given for some knowledge of such liberal subjects as Greek, Latin, history, philosophy, the arts, and music, tempered by the opinion of the Conference that science was not inferior to the humanities as an educational exercise. The Conference can perhaps hardly take credit for the proposal of Oxford and Cambridge to remove Latin from the compulsory entrance subjects, but certainly it is only since the Conference that this measure of educational freedom has been instituted. It appears that as a direct result of the Conference some medical schools have adopted new educational devices for assessing the character and intelligence of entrants to the medical profession.

In respect of the aim and content of the curriculum, Sir Richard Livingstone's advice that our aim be a

*An address given to the Second World Conference on Medical Education, Chicago, 1959.

"basic doctor with the philosophy of the first-rate" has made a striking impact on most delegates, and it must have echoed and re-echoed literally hundreds of times these last five years in university planning committees all over the world. In this field striking results have in fact been reported, and the delegates from a majority of medical schools record improvements or at least changes, though only a minority ascribe these changes directly to the Conference.

Anatomy and physiology have in many places been integrated, though in some newer universities in less industrialized countries there is a lack of teachers in these subjects. An introductory or basic course of clinical medicine has been very widely introduced, sometimes by the direct machinations of a delegate to the Conference, and in a good many places surgery and medicine have themselves been integrated with anatomy, physiology, pharmacology, and pathology.

A few schools have actually managed to call a halt to expansion of the curriculum, and some show a new restraint in the teaching of the narrower specialties.

Psychological medicine is in some places now covered by a broad general course, with the implied recognition that clinicians in their general teaching of medicine and surgery must accept responsibility for instruction in psychological aspects of their clinical work. In a good many countries the teaching of detailed obstetrics is contracted, with a compulsory increase in the teaching of antenatal and post-natal care.

The Conference attracted additional publicity, if that were possible, to the important experiment at Western Reserve, and that medical school must have been embarrassed by the number of visitors which their Conference delegates attracted. One refreshing result of the Conference that is unmistakably on the positive side is the international visiting which has resulted from new acquaintances made in London five years ago.

The section on technique and methods has come in for a good deal of praise and some criticism. The practice of reducing attendance of students in operating theatres to an absolute minimum has become much wider since the First Conference. In many places the medical students now visit patients in their own homes. Polyclinics for the use of students in out-patient departments have proved to be very popular, and the Singapore experiment of providing laboratories, *x*-ray apparatus, endoscopic facilities, and electrography in the polyclinic has been followed in some other places. Reactions to the various lectures and demonstrations on visual aids have been less uniformly popular. Expense seems here to have prevented ideals from being attained.

Medical Films and Libraries

I have explored the suggestion made at the First Conference that a central museum, based on the Wellcome principle, should be established for the collection and distribution of demonstration material, but this seems to be quite impracticable. More possible is the preparation of an index of medical films. Dr. J. M. Mackintosh, of the World Health Organization, has given me advice in this matter. He informs me that the preparation of an index of these films would offer the greatest possible difficulties. Thousands of medical films exist of a quality varying from excellent to useless. At a recent conference on accidents in the home over 50 films were produced on this subject alone, and a W.H.O. seminar had the greatest difficulty in distinguishing the good from the bad. There are also many lists of films extant, none of them complete, few of them evaluated, and most of them out of date. It seems probable that only a limited scheme could be attempted with any prospect of success. Some countries already have a centralized film service, such as the Medical Committee of the British Scientific Film Association, the British Medical Association, the British Council, the Canadian Government, and the American College of Surgeons, and the Film Reference Guide for Medicine and Allied Sciences of the U.S.P.H.S. A multiple index comprising the individual indexes of such organizations, kept fully up to date and strictly selective by high-level national appraisal, would seem easily possible and might be very profitable.

In many centres the data produced at the First Conference on medical school libraries have been responsible for local improvements. The report that in the United States medical school libraries varied between 3,000 and 375,000 volumes shows how much still remains to be done in this field. As a result of the Conference, a good many medical centres are now giving their students instruction in the use of the library.

No one seems to have changed his view, whatever that was before the Conference, about the superiority of the internal or the external examination, but multiple-question examinations have been brought into use much more widely than I for one would have imagined.

Little has been reported by my correspondents on changes in the teaching of preventive and social medicine, but several medical schools have recognized as a result of the First Conference that special departments are necessary for the teaching of these subjects. Note has been taken widely of the need for the student to realize the importance of a full industrial history, and in one centre tape recordings of social interviews have been introduced for student instruction. In a few places students have been encouraged to undertake family supervision.

Conclusion

It would thus appear that there have been wide repercussions from the First World Conference even though some individuals have been disappointed, only a few of them in the Conference itself, many of them in what they have been able to achieve as a result of the Conference by direct action in their own medical schools. The Conference does, however, seem to have more than justified the communal expense and the time expended. It should be said that at the start of this Conference many of my correspondents expressed some dissatisfaction at the actual form which the First Conference took. Many were disappointed that the greater part of the time was taken up by the delivery of previously prepared papers. They would have preferred open discussion, possibly by panel groups, and a less rigid presentation of unrelated or repetitive facts and opinions.

In closing I must express my very great gratitude for the trouble so many busy medical teachers have taken in replying to my inquiries in detail. To have mentioned them all would have been impossible, and I therefore have avoided the mention of any. I hope my correspondents will accept this very deep expression of acknowledgment and gratitude.

INTERNATIONAL CO-OPERATION IN POSTGRADUATE MEDICAL EDUCATION*

BY

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It would be impossible and perhaps superfluous to attempt to review in a brief statement all the efforts and methods applied internationally in relation to what some call "post-basic" medical education. Therefore I shall limit my remarks to a few more general aspects of the subject.

The desire to share with others the benefits of advanced knowledge was characteristic of all truly great civilizations. Indeed, many famous centres of science in the East and the West alike, at the time of their flourishing, spread medical knowledge far beyond the boundaries of their countries.

Because of its multiple roots, its goals, and its applicability, medicine is with good reason looked upon as an international science and a part of a world-wide civilization.

Outstanding medical achievements sometimes place one or another nation ahead of the others and make such a nation the example and teacher. But so far in history, such a leading position usually has been rather limited in duration and scope; no single centre, no single country—no matter how powerful—has been able to rely exclusively on its own resources and stimuli for any length of time.

International co-operation in advanced—that is, postgraduate and graduate—medical education has mainly two aspects: (1) training abroad at a level, or regarding a type of knowledge, not available at home, and (2) keeping abreast of medical progress achieved elsewhere.

A large number of forms and methods have been tried out, applied, and developed in this area by various agencies and institutions working in collaborative activities. For instance, the W.H.O. in its programme uses (1) fellowships and travel grants for studies abroad, (2) visiting professors for short and long assignments, (3) visiting teams of medical scientists, (4) consultants on educational matters, (5) exchange of teaching and research staff, (6) international courses and seminars, (7) support to conferences on medical education and world-wide, national, or regional meetings, and (8) studies of selected educational subjects.

Studies Abroad

In relation to training abroad, it is interesting to observe that, in spite of the various financial, administrative, and linguistic barriers, about 20,000 medical people studied abroad in each of the last few years, and over 2,000 institutions accepted foreign postgraduate students. In recent years a higher proportion of these studies has been sponsored by official agencies in comparison with the early part of the century, when much study travel was personally arranged by the interested individuals. We can also note a gradual increase in educational travel sponsored by international agencies. In several countries special arrangements have been made in order to meet the growing programme for foreign physicians and to facilitate access to host institutions. In some of them the programmes sometimes go beyond the walls of the host institutions and include extramural aspects of the problem studied.

This point deserves some elaboration. In almost all countries great advances in health could be achieved through medical and related measures right now if the already available knowledge were put into action properly and on an adequate scale. Therefore, acquaintance with methods of practical and massive application of medical progress is often equally important to foreign students as the acquiring of the scientific substance itself.

Anyone who is acquainted with the problem knows how often postgraduate students from many countries have been frustrated on their return home because of the difficulties they encountered when they tried to apply their new knowledge in their own local conditions. The stronger ones among them attempted to change the conditions—not always with success—but many became discouraged and limited their struggle to their immediate personal problems. How often the latter return from foreign study acquainted with only one organizational pattern of medicine, of medical research, or of their own specialty. They are naturally bound to imitate the only pattern they know, and could be easily criticized at home for imposition of a foreign model unsuitable for the local conditions. Studies in more than one country can improve the situation, but the problem should really be tackled from the other end—that is, finding out the proper ways to advance the matter in the country itself. A great task emerges of making education abroad meet the real needs not only of the students themselves but also of their nations. This in turn requires much more knowledge of the various ecological and health conditions in all corners of the world.

In addition to the well-recognized, time-honoured objectives to improve the individual's knowledge and technique, and to stimulate research and teaching in the home countries of students, international co-operation should put great emphasis on the search for talented persons who, because of lack of adequate conditions in their own country, cannot develop to their best and thus remain lost to their nation and to medicine.

Another aspect of training abroad needs to be strongly reflected in the programmes—that is, preparation for the functions of leadership in the student's own specialty. Whereas upon completing their training the national trainees usually expect to find a clearly defined place in an organized structure under the guidance of more senior leaders, the foreign trainees quite often will be the only advanced specialists in their city or their country. They will have to do the pioneering work, create the working conditions for themselves and their juniors. Although it is true that good individuals make good institutions, the complexity of modern medicine requires well-organized machinery at its every step from research to practical massive

*An address given to the Second World Conference on Medical Education, Chicago, 1959.

application. Some knowledge about these matters should be acquired at some stage of all the types of programme we are considering here.

Technical skills, scientific methodology, acquaintance with the modern equipment, are but a part of the benefit of the training abroad. This should be supplemented by inspiration with medical and scientific ideals, social usefulness of medicine, and knowledge of effective organization of work. With all due respect to the spontaneous growth of national experience in these matters, the potentialities of international cross-fertilization of ideas should not be overlooked. Indeed, they urgently need further energetic advancement.

In spite of their unprecedented growth, studies abroad still do not meet adequately the needs of all nations. Moreover, the other equally important side of the same problem remains even farther behind the needs and requires even more vigorous strengthening and support. This is bringing the advanced medical knowledge from abroad to the place within each country where it can be usefully absorbed. National centres for advanced education can reach a greater number of doctors than those who can travel abroad. International support is greatly needed for the establishment and operation of such centres, for in several countries national resources can be stimulated and developed if strengthened from abroad.

In some areas a national centre for postgraduate education can serve several neighbouring countries and thus become a regional centre. In others a co-operative inter-country programme can be limited to certain selected subjects. Examples of successful international co-operation of this kind are already available. They should be followed.

Importance of Research

Everybody to-day is convinced of the importance of fundamental research in medicine, and the problem of development of researchers and teachers will receive adequate attention at this conference. Therefore it will suffice here just to emphasize that international co-operation in this area seems to be particularly indispensable and promising. However, medical knowledge finds its complete justification, and indeed its title to glory, when it is fully and widely applied to all people in all nations. Postgraduate educational programmes should be conceived with the consideration of this basic aim of medicine in mind.

In spite of some shortcomings, other means of advanced education, such as international scientific and professional meetings and the flow of medical literature between countries, continue to increase in scope and volume. Language difficulties still represent a considerable handicap in communication, but there is still another point of some importance which may be raised in such an international gathering as this conference. Medical literature and other educational media in many countries give relatively more attention to the achievements of their nationals than of foreigners. Except for a number of universally recognized names, medical publications, and particularly textbooks, mention more often the names of those who published in the same language than in others. This rather understandable phenomenon presents some problems, as, for instance, when medical progress is attributed to the contributions of the various national or linguistic groups. Attempts have been made in some countries to review medical history so that the contribution of those who worked and published in the less-known languages might be duly recognized. This trend to appreciate the "forgotten men," not only of the medical past but also of its present, may well deserve some place in international educational co-operation. I cannot forget an experience in a country exposed to changing cultural influences, where the oldest group of leading medical scientists reflected the influence of German medicine, the middle-aged group French, and the youngest one English and American medicine. The loyalty to their teachers and the literature of the language they knew well made the understanding between the three groups quite difficult.

Some understanding between the natural preponderance toward national source and a broader international perspective may lead to more just and balanced views on the truly multi-national sources of medicine, yesterday, to-day, and to-morrow.

Further exploration and action through international co-operation is needed in postgraduate medical education, with particular regard to programme, co-ordination, languages, orientation. The following questions might be asked:

1. How to develop further internationally assisted programmes best suited to the future responsibilities of postgraduate foreign students and the needs and potentialities of their countries? This should also include international support for the host and home training institutions.

2. How to bring about a sufficient but not too rigid co-ordination of the various efforts undertaken internationally?

3. How to overcome the language barriers in the flow of medical knowledge, particularly with regard to the less generally used languages?

4. How to preserve, enrich, and make universal the inherent permanent values of medicine, independent from transitory "cultural accretions" and national dominations, which can constructively support any freely developing culture based on science and ethics and thus permeate international educational programmes?

The answer to these questions should bring us closer to Descartes's far-sighted image of medicine as a constructive guide towards a better and wiser community of men throughout the world.

Supervoltage and radioisotope radiation has an essential place in the treatment of cancer, and one of the main requirements at the present stage is the specialized training of personnel. This was the conclusion of a Study Group convened jointly by the World Health Organization (W.H.O.) and the International Atomic Energy Agency (I.A.E.A.), which met in Vienna from August 3 to 5, under the chairmanship of Professor B. W. WINDEYER of the Meyerstein Institute of Radiotherapy, London. Training programmes should be utilized extensively for this purpose, the Study Group recommended, as should exchanges of experts and visits to radiotherapy centres in various countries. It was the opinion of the Study Group that further studies would be needed particularly with reference to the determination of the radiation doses (dosimetry) in clinical practice, the standardization of radiotherapy methods and their clinical evaluation. The Study Group consisted of radiotherapists and radiation physicists from Canada, France, Germany, Hungary, Italy, Japan, Mexico, Sweden, Switzerland, United Kingdom, U.S.A., and U.S.S.R.

INTERNATIONAL CO-OPERATION IN POSTGRADUATE EDUCATION*

BY

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Higher education in the science and practice of medicine to-day become an endeavour which can hope to succeed only if it can stretch and reach across national or regional boundaries. Since the last great war many areas in the world have emerged as newly independent political units. The invigorating breath of real freedom has aroused these people, and has triggered a chain reaction of unprecedented vigorous activity in these new nations. Their task, however, is colossal in its extent. Expert planning and very careful decisions on priority are needed. Problems threatening the mere continuance of living existence must always take priority over the urge for better standards of education or of better amenities in life. In the circumstances it is inevitable that all underdeveloped countries face a severe shortage of trained men and efficient tools in all fields. Before they can raise their level to self-sufficiency, even in minor things, they cannot but depend on help and co-operation from the better-placed members of the free world. Medical education in general, and postgraduate medical education in particular, is one such field which in spite of its recognized importance for world health, cannot get top priority in an area which suffers staggeringly low levels of food, clothing, and shelter.

As a member of one such nation, struggling to avoid being coerced into wasteful violent pursuits so as to be allowed to raise its standards of life, I must bring to your attention these realities of life, and I must voice our great hope and faith in the free world for international co-operation in the matter of postgraduate medical education. I cannot begin this presentation, therefore, without a sincere compliment to the vision of those international agencies like the Rockefeller Foundation, which has sponsored this my visit, the W.H.O., T.C.M., Colombo Plan, etc., which have already contributed so much towards medical research and education in underdeveloped countries. We have gained through this experience a much better and clearer understanding of the problems which face us in postgraduate medical education. It shall be my effort here to record some of these problems and to explore the ways to meet them.

While I shall strive to highlight only those problems which have a clear international bearing, you will pardon me if the examples I cite are from areas where I work. After all, India is what I know best.

A Persistent Demand

A major problem in postgraduate medical education† in India stems from the rapid increase in the number of medical schools. In 1926 we had ten medical schools in India. In 1947 our country was partitioned, and by 1949 Free India had created 13 new medical schools towards meeting the demand for more doctors. This demand persists; to-day we have 50 medical schools, and by 1965 this number is planned to be raised to 67. The drug industry has also awakened to much greater activity, and a number of co-operative international combines have started their plants in India, creating a significant demand for persons qualified for medical and scientific work.

The consequent increase in our educational requirements presents many important facets. A number of these call for international help and co-operation. A major one concerns teacher training. We have an acute lack of medical teachers, so that our departments, especially the preclinical ones, are headed on the one hand by men long beyond their age of superannuation or on the other by young teachers before they are sufficiently mature for the task, while many teaching posts remain vacant. In clinical subjects the problem is further complicated by the enormous amount of out-patient and in-patient hospital work which has to be tackled by the personnel before they can attend to any teaching or research. Moreover, in many schools there are only part-time or visiting clinicians, and the situation is still worse. Great efforts are being made to establish full-time clinical departments, but with only indifferent success. There is a general shortage of doctors, and, as everywhere, teaching careers are not financially attractive. For example, at my school in Bombay, before the Rockefeller Foundation extended its help, we could not plan our full-time medicine and surgery departments. Thus there are many schools and not enough teachers.

This situation has created a peculiar demand on our postgraduate training programmes. Particularly in preclinical subjects, it is expected that every postgraduate student will automatically be able to head a new department a few years after his training. In our postgraduate educational need, therefore, apart from the accepted dictum that a candidate should be encouraged to work on a problem of his own interest, it also becomes necessary to interest him further in the methodology and the techniques of the subject as a whole.

For any effective fulfilment of these requirements we must for the most part invoke international co-operation. For only those departments which already maintain a broad interest in research and follow a virile educational policy can fairly be charged with this task if adequate standards are to be attained. Most of our postgraduate students therefore aim, and hope, to be sent abroad in order that they may obtain intensive first-hand experience of working with a dynamic team of teachers, and also broaden their outlook by travel abroad. Recognition and comprehension of this by our teacher colleagues abroad is vital. I shall return to this point later.

In the matter of adequacy of research equipment international co-operation has been our mainstay, and it will continue to be so for some years to come. Let me therefore not labour this point. Rather would I stress the great need of institutional workshop facilities and technician-training programmes on a nation-wide basis. It will astonish some of you, that workshop facilities are not available to every medical institute in India. The effects of this want are too obvious to need discussion.

Forms of Co-operation

International help and co-operation has evidently an important role to-day in our efforts to meet the varied

*An address given to the Second World Conference on Medical Education, Chicago, 1959.

†Let me parenthetically add here that by "postgraduate" education I refer to that training period which comes after the qualifying examination for registration as a doctor.

requirements of postgraduate medical education. Fortunately, the existing international agencies already have well-laid-out channels for international co-operation, and a variety of forms of this co-operation are also well known. Visiting professorships, teacher exchanges, fellowships, and travel grants are some of them. I have already referred to equipment gifts. These may be made available through : (*a*) private funds—for example, Rockefeller Foundation, Ford Foundation, etc. ; (*b*) business corporations ; (*c*) universities establishing co-operative relations with universities of other countries, with mutual benefit ; and (*d*) international organizations like W.H.O., F.A.O., Unesco, etc.

I would like to quote certain advantages attached to help available from private foundations, such as : "(1) flexibility of programme ; (2) capacity to make commitments over a considerable period of time ; (3) comparative freedom from political complications ; and (4) ability to support search for knowledge without undue regard to short-time practical results." International co-operation, keeping in mind the above considerations, will help a long way to solve this enormous problem.

Experience regarding visiting professorships to countries like India deserves study. The impressive work done by visiting professors in India, Burma, Malaya, Egypt, etc., has gone a long way towards stimulating medical research activities among the younger staff of the institutions visited. While this general awakening is of great importance, it is nevertheless true that if our objective is to develop institutions, department by department, so as to equip each for postgraduate educational responsibilities, it has to be admitted that much remains to be desired. Now, it must be agreed that full professors from the United States, Canada, U.K., etc., cannot be blamed if they are not eager to spend as much as a year or two in India. Yet, if it is the full growth of a department which we desire, nothing less than a full professor with maturity as an academician and experience as a head of the department and postgraduate teacher is needed to organize and develop the required spectrum of activity in a department so that it can undertake postgraduate training in a variety of aspects of the particular discipline. This, however, is not easy.

The idea, therefore, of exchanging teachers is more practicable and perhaps more profitable. It has to be a true exchange of teachers, however, each man giving his place to the other so that the experiences from the same department are discussed and exchanged over the entire period on a person-to-person basis. In fact, I would even suggest that the Indian counterpart should continue in his exchange department for two to three months after his exchange teacher has returned.

Fellowships of short and long duration have been in vogue for some time. In view of the probability that Fellows trained under these programmes are liable on their return to be charged with postgraduate education, a revision of their training programme abroad seems indicated. There is much in favour of the current practice of encouraging Fellows to desist from routine course-work towards degrees, and to concentrate on some good research activity. It is also necessary, however, that the Fellow does not confine himself exclusively to one kind of work, but, in addition, obtains experience of all the current activities—teaching and research—in the department where he works.

May I at this stage make another suggestion which concerns the biological aspect of medical sciences ? In India postgraduate students in physiology and pharmacology are as a rule medical men, so that postgraduate education in these disciplines is almost exclusively medical in motivation. Little is easily appreciated, therefore, of the broad biological spread of these disciplines. The inclusion of non-medical biochemists as teachers in medical schools has not helped this situation much. It should prove interesting to place some medical postgraduates in exclusively non-medical laboratories and institutions for a portion of their fellowship. The work problems would, of course, be the same or similar, but a different or broader perspective is likely to be obtained from such environmental changes. The Institute of Biology at Cambridge under Professor Gaddum, the Chelsea Polytechnic Institute, London, and the Marine Biological Laboratory at Woods Hole, Massachusetts, are the kind of places in my mind in this connexion.

A Crucial Phase

All fellowships, travel grants, etc., are most effective when they are so timed as to meet a crucial phase in a person's professional career—when he needs an extra stimulus or assistance to move him beyond the limits of his formal training or the confines of departmental circumstances. It is a common experience that a young man works sincerely for some years after his return from a fellowship abroad, only to find himself slowed down, if not "spent out," in the organizational base work of his new department. And yet it is at this stage that he best appreciates the little gaps between the foreign training he has received as a young man and the local requirements he has appreciated anew from active experience, and it is also at this stage that he can really comprehend his professional needs for the future. A return visit abroad, even if for a short period, at this stage pays rich dividends. I would urge, therefore, that our fellowship programmes should from the very beginning of the project be regarded as a two-stage operation. I have seen such repeat visits being used to great advantage by some progressive drug industrialists of India, and I know of specific cases where much is being lost for want of such a renewed stimulus to an otherwise promising and capable worker.

One very important aspect of postgraduate education on the clinical side is the setting up of a well-planned residency training programme. This has not been possible, even though its importance is well realized, owing to lack of funds to pay and house the trainees : help from international co-operation is urgently needed in this direction.

The equipment of the increasing number of our medical institutions with adequate library facilities is another task which can be undertaken only with international help and co-operation.

I have spoken mainly of our peculiar problems in postgraduate medical education in India. I have avoided discussion of problems common to all, such as (1) selection of and incentives to postgraduate students, (2) training methods and programmes, (3) medical versus non-medical training in basic medical discipline, etc. Let me conclude with a mention of two avenues of medical work in India which may interest postgraduate or postdoctorate persons in this part of the world.

We have in India enormous out-patient attendances every day—perhaps this also is true of Burma and some other Eastern countries. At our hospital in Bombay the out-patient department attendance every morning is 2,400. This out-patient service is almost a specialty, distinct and different from others. The diagnosis and assessment of progress as practised here have to be seen to be believed. It is not clinical medicine alone, although it is the most "clinical" of all medical activities. The full educational potential of this phase of medical service in India has remained unexplored. I invite the clinical teachers amongst you to India for this experience, which will certainly be interesting.

I would also invite public health teachers to come and get acquainted with our rural and public health projects. Perhaps your concepts regarding public health, your impressions about standards of normal health, and therefore your expectations about the practicability of solutions to rural health problems will be subjected to considerable strain, but in your first-hand acquaintance with this problem lies our hope for a more practicable approach towards a healthy world.

INTERNATIONAL CO-OPERATION IN POSTGRADUATE MEDICAL EDUCATION IN MALAYA*

BY

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The cessation of hostilities in South-East Asia in 1945 imposed serious problems in the medical rehabilitation of my country. Some of the graver issues involved were the considerable depletion of senior and experienced teachers and medical specialists in the university and Government Medical Services as a direct result of the war.

The enforced closure of the medical school during the period of hostilities and enemy occupation for a period of five years added seriously to the problem of an acute shortage of doctors for the whole country, while damage and destruction of hospitals and other buildings during the war aggravated the problem further.

The gigantic task of rehabilitation was faced with the twin problems of producing more doctors, teachers, specialists, and research workers, and of constructing more hospitals and repairing damaged buildings, both of which were tackled with eagerness and determination. The problem of rehabilitation was greatly complicated by the inevitable changes which wars have always brought about. The changing political pattern from a colonial to an independent self-governing status; the awakening of national and political consciousness of the people recently liberated from enemy occupation and oppression; the natural aspiration of the citizens to get into the top posts in medicine and the other public services of the country, previously barred to them, by the rapid Malayanization of the medical and public services; and the consequent staggering and eventual cessation of recruitment of specialists and senior consultants into the Medical Service of Malaya by the Colonial Office in London, were some of the complicating factors which added to the difficulties of medical rehabilitation.

*An address given to the Second World Conference on Medical Education, Chicago, 1959.

Our National Effort

I am sure I am expressing the gratitude of our country for the help and encouragement we have received from international co-operation in our national effort. We have, on our part, doubled the intake of undergraduates into our medical school, so as to produce more doctors for the country. We have also recruited doctors from India, the United Kingdom, and the other Commonwealth countries to meet the shortage of medical personnel. Where no local candidates were available to fill the important posts we have recruited medical specialists and dental specialists from overseas. We have increased the number of scholarships and fellowships a hundredfold to enable our medical and dental graduates and nurses to go to the United Kingdom, to the Commonwealth, to the United States, and to Europe to study and to do research so as to equip them with the knowledge and experience to return as specialists and teachers in the various fields of medicine, dentistry, and nursing.

The University of Malaya, conscious of the importance of postgraduate medical education, instituted, with the assistance from the World Health Organization, who supplied teachers and fellowships, a diploma course in public health for graduates from Malaya and from South-East Asian countries. The course has been in existence now for five years, and its importance in providing men and women trained in the principles of preventive medicine and public health in a rapidly developing rural and industrial area is beyond measure.

International Help and Co-operation

In order to assist in this programme of postgraduate medical education, the Colonial Development and Welfare Fund of the United Kingdom contributed a major share in the cost of the construction of the magnificent building of the Institute of Health, where undergraduates and graduates in medicine and nursing are trained in the principles and practice of public health and social medicine.

Through the assistance of the Colombo Plan and with the co-operation of the Postgraduate Medical Federation of Australia, eminent and experienced teachers from Australia are being sent regularly by the Royal Australasian College of Surgeons to teach and examine graduates specializing in the many fields of surgery at the Faculty of Medicine and the Teaching Hospital at Singapore.

The China Medical Board has made several handsome contributions for the development of a first-class medical library housing 70,000 volumes and 600 international medical journals and for the purchase of much-needed and valuable equipment and apparatus for basic research in the preclinical departments of the medical school.

The Colonial Development and Welfare Fund of the United Kingdom has helped us to build a new and imposing department of pathology and museum to assist in research and teaching. The nursing school, too, has increased its intake of admission for the nursing profession. In this school, the Government and university specialists, assisted by a team of World

Health Organization tutors, have developed a number of postgraduate nursing diplomas, such as ward administration, paediatric training, orthopaedic nursing, psychiatric nursing, tuberculosis training, so that more girls are obtaining their postgraduate diplomas in the country and fewer are going overseas to the United Kingdom and the Commonwealth for their postgraduate education.

The medical school has also been assisted by visiting professorships in parasitology, and a visiting professorship in pharmacology is being arranged with the China Medical Board at this moment.

It might appear to be a curious fact that, while international jealousies and national monopolistic tendencies were, and indeed are, prevailing throughout the world, international co-operation in medicine has been a feature—one which must have puzzled the orderly thinking of many a philosopher.

Outstanding among these developments could be mentioned the wide and easy dissemination of scientific discoveries within and without countries, whether they were at war or at peace or whether they were racially or otherwise on friendly terms. Even more outstanding, perhaps, has been the effort at international co-operation, and indeed control, for the prevention of entry of disease into one country from another. Talent, wherever it existed, has been recognized by medicine without fear or favour, and it has borrowed abundantly from these sources.

Developments in transport, particularly during this century, have contracted the world almost to insignificance. To-day, one does not fear the challenge of a hazardous journey of a few thousand miles, as our forebears had to face. These developments have naturally tended to bring persons of eminence, of wisdom, and of knowledge in contact one with the other, and so have enabled more liberal and intimate discussions on which a basis for future development, for future programmes, and indeed for future ideas can be more ably formulated.

International co-operation in such development and in dissemination of knowledge has come from numerous sources. It will be sufficient for me to quote only a few examples. The widespread medical journals; the inter-library facilities; the large numbers of foundations devoted to medicine, such as the Carnegie, the Rockefeller, the China Medical Board, the Colonial Development and Welfare, etc.; the specialized agencies devoted to health of the United Nations, such as the World Health Organization; the co-operative efforts engendered by the Colombo Plan countries and the South-Pacific Area Commission; the Inter-University Exchange Scheme—all these have furthered and encouraged international co-operation in postgraduate medical education.

Benefits to Malaya

Malaya has benefited enormously from international effort. We have profited by the postgraduate medical education given to our students in universities and other medical institutions in countries overseas, particularly the United Kingdom and Australia. We have profited even more by the experts from other countries who have come to work amongst us. A group of American scholars working in the Institute for Medical Research in Kuala Lumpur discovered, quite by accident—though by design in so far as they were in Kuala Lumpur—that chloramphenicol is as much a specific for typhoid as it is for tropical typhus. It might also be profitable to mention the work of the Medical Research Council in Singapore in the study of tropical conditions, in close liaison with the department of physiology. We have, of necessity, had to limit postgraduate training facilities for our doctors to countries we know more intimately than others. Consequently, for this purpose many of our scholars go to the United Kingdom or to Australia, and a few to the United States of America and Canada.

It does not, however, follow that other countries cannot contribute to our knowledge. I believe that the more widely spread our ideas and purposes are, the more we shall profit by an encounter with what might perhaps appear to be antagonisms, though I do not believe that, in fact, antagonisms exist in medicine.

International co-operation, therefore, in the field of postgraduate medical education should yield far more practical results than the insularity of breeding and thought, which in fact would impose limitations to progress. It is by the appreciation and realization of the significance of various facets which constitute what might be the truth that we may be enabled to get a glimpse of the ultimate truth.

If I may be permitted to digress a little, medicine has in recent years been drifting away from its purpose. We have been so much engrossed with the significance of bacteria and viruses, of antibiotics and pharmaceutical preparations, of the heart and the lungs and the liver and the other viscera, that we are in grave danger of not realizing that the human being is much more than the sum total of all his constituent parts. We are dealing with a being—quite apart from what our religious teachers tell us is a soul—who has his own particular physique, intelligence, aptitudes, attainments, interests, and disposition; and this being has been subjected to numerous stresses and strains by the environmental circumstances of his living. We have to realize that he is a thinking thing, a feeling thing, an emotional thing that has been moulded and shaped by his environment either to live sensibly and in rapport with his fellow beings or as a rebel among them.

Conclusion

The fact that the word "disease" has been so divorced from its original meaning emphasizes how far medicine has departed from its original purpose. It is right that we should remind ourselves what disease is. It is not tuberculosis; it is not typhoid; it is not cholera, or any of those descriptions that appear in textbooks. It is in fact *dis-ease*. Does it really matter to the man whether he has cancer or hypertension if he is not at "dis-ease," so long as he feels no ill, so long as he works efficiently, so long as he thinks well, so long as he is able to contribute abundantly to his country and live joyfully? Can we, as physicians, be exonerated from the indictment that we have often made the "cure" of such cases more grievous than the endurance thereof? The World Health Organization defined health in a more liberal way than I have done. It says "it is a state of physical, mental, and social well-being and not just the absence of disease."

While we accept the fact that organic pathology is likely to produce disease, we must take cognizance of this—that many more things than organic pathology can cause dis-ease. Now this presupposes a wider (and

more liberal) knowledge than that provided by the ordinary medical education, whether undergraduate or postgraduate. It presupposes a knowledge of a kind which embraces within it the humanities, the religions, and a deep understanding and sympathy for the living man and a sincere respect for the human personality.

International co-operation in postgraduate medical education, while much greater than it ever was before, is not yet sufficient. And the tragedy of it all is that developments in other fields of science—for example, nuclear energy and conquest of space—are proceeding so fast that we appear to be lagging behind. Not only this; we would have to face the challenge of these developments, and if in the hour of need we fail, we shall not only be held to blame but to ridicule as well.

Do not for one moment think that remote countries, underdeveloped countries, or small countries will not be able to contribute anything significant to the development of postgraduate medical education. Underdeveloped countries and such countries as I live in can contribute much, but the fact of our contributing something to your knowledge, and your even greater contribution to us, would be as nothing compared with the synthesis that will emerge as a result of this co-operative effort. A broader vision, a wider field, and a more deliberate appreciation and consciousness of our purpose and aims will be furthered by such efforts, and I make an appeal here and now that we should intensify international co-operation in postgraduate medical education with the least possible delay.

THE VALUE OF PARTICIPATION IN RESEARCH AS A COMPONENT IN THE EDUCATION OF DOCTORS FOR THE MEDICAL, GRADUATE, AND POSTGRADUATE STUDENT*

BY

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There is no need to document the value of medical research as a major factor in the constantly improving well-being of mankind. It could be convincingly contended that our knowledge of health and our control of disease have progressed farther in the last 50 or 60 years than in all the preceding countless ages of man.

Further, it is unnecessary to declare the value of participation in research for a medical student who anticipates either a career of full-time investigation or part-time clinical research supplementing the practice of medicine. The methods and tools of research, the nature and conduct of investigation, must be learned early. A physician who has done no investigation by the time he has finished his postgraduate residency training is unlikely to make significant contributions to research in his subsequent career.

It is self-evident that research must continue to increase our understanding of man in health and disease, and also that experience and training in scientific investigation are essential at an early stage in the education of the physician who intends to continue to carry on research. This presentation is concerned rather with the value of participation in research as part of the experience of a medical student who may not again work in a research laboratory, who has no intention of conducting further clinical investigation, or who will never write another scientific paper. Some training in research can contribute enormously to the education of such a physician, engaged entirely in clinical responsibilities, as is necessarily the case with most physicians.

Evaluation of Research Reports

Past research experience by a physician who is now fully engaged in clinical practice sharpens his judgment and enhances his evaluation of the research of others. "Medicine, a lifelong study," requires the physician to keep abreast by reading the journals and listening to scientific papers. Research necessitates a struggle with data collected, requires a sifting and sorting of experimental results, insists upon a recognition of deficiencies in the supporting evidence, compels the reaching of conservative conclusions warranted by the objective findings. Experience in research warns against the pitfalls of inadequate numbers of observations, faulty controls, inaccurate measurements, the intrusion of chance, the inherent variability of biological material. Engagement in research enhances the physician's judgment of conclusions reached in medical papers he reads, sensitizes him to inadequacies of evidence, increases his wariness of exaggerated claims, tempers his acceptance of enthusiastic predictions.

Difficulty of Discovery

Research has been called "a way of making Nature talk." But Nature guards her secrets with intense jealousy and is loath to speak. Research reveals the painful difficulty of discovery.

To the layman, who reads only the newspaper or popular magazine accounts of discovery, the pathway is easy. To the more sophisticated, such as a medical student or practising physician, somewhat familiar with research literature, the difficulty of making a contribution to knowledge becomes more apparent. But it is only the student or physician who has actually participated in research himself who is completely aware of the tremendous effort and patient toil which are exacted of an investigator who establishes even a very little new fact or a causal relationship.

A celebrated exception to this axiom was the discovery of vagus material, by Otto Loewi. He recounted that he had an idea one night, in bed, and went to his laboratory next morning to test his thought. In this instance, only a day elapsed between the idea and the demonstration. New principles of broad physiological application emerged: not only the concept of neuro-humoralism but eventually also the theory of chemical transmission of nerve impulses across synapses.

*An address given to the Second World Conference on Medical Education, Chicago, 1959.

Much more characteristic of the unhasty pace of research discovery is the story of insulin, with the long and laboured span of three decades between the experimental production of diabetes in dogs and the beginnings of its control in man. Years of frustration were the only rewards of investigators probing this most jealously guarded secret of nature. The dual function of the pancreas, as a digestive and an endocrine gland, the concept of hormonal secretion, the idea of replacement therapy, the enzymatic destruction of islet secretions in crude pancreatic extracts, the correct *p*H to preserve the islet-tissue hormone, the embryonic history of the pancreas (noted and utilized by Banting), the purification of the embryonic extracts of islet tissue free from digestive secretions, and, finally, the therapeutically successful injection of these extracts into diabetic dogs, took years and years and years of labour and failure and frustration.

The struggle for insulin soundly documents that hard lesson of research experience, the difficulty of discovery.

Pursuit of a Scientific Hobby

Even though a physician may do no research or engage in a limited specialty such as cardiology, a past research experience may provide a rewarding hobby or special interest to be followed at least in the literature and perhaps also at scientific meetings.

The postgraduate resident physician who spends only three to six months in a cardiac catheterization laboratory might be prompted to follow subsequent findings in this field with considerable gratification. He will observe with special appreciation the latest developments in artificial blood circulation, extra-corporeal aeration of blood, refrigeration, control of cardiac arrest, electrical pacemakers, intracardiac prostheses, repair of valves and septal defects—the many discoveries to come in the control of congenital and acquired cardiac defects.

Alertness for the Unexpected

Research develops an alertness to the apparently inconsequential. In carrying out any research project it soon becomes apparent that it is essential to be for ever on the alert for an unexpected observation sometimes seeming almost to be an accidental occurrence.

Each such occasion must be given due weight. The incidental observations may prove to be far more important than the original goal sought in the experiment. The magnitude of Fleming's discovery was not at all apparent from his simple description of an experimental accident of vast moment: "While working with staphylococcus variants a number of culture-plates were set aside on the laboratory bench and examined from time to time. In the examinations these plates were necessarily exposed to the air and they became contaminated with various micro-organisms. It was noticed that around a large colony of the contaminating mould the staphylococcus colonies became transparent and were obviously undergoing . . . [destruction]."

This kind of alertness to apparently insignificant detail, not directly in the pathway of the moment's reflection or not immediately integrated into the experimental context, has yielded many a discovery. For lack of this sensitivity how many important discoveries were missed: the vector of transmission of the poliomyelitis virus, the arresting of mitosis in cancer cells, the dissolving of a blood clot in a coronary vessel.

Clinicians who rise above the common lot have, perhaps in many instances through research experience, similarly become allergic to the minute, the obscure, the incongruent. A few tiny petechiae may point to a sub-acute bacterial endocarditis in an obscure complex of signs and symptoms. A 30-year history of healed pulmonary tuberculosis might provide the diagnostic clue to a painful palpable mass in the pelvis.

Collaboration in Clinical Practice

Research provides lessons in team-work. Little modern research of consequence is carried on by the lone investigator. More commonly in evidence is the combined effort of experts in several disciplines. Studies on poliomyelitis vaccine necessitate collaboration between the bacteriologist, neurologist, internist, statistician, epidemiologist, biochemist, pathologist, and others as well.

Team-work in clinical practice is equally necessary, particularly in dealing with complicated problems. In a modern clinic it is not unusual for experts from half a dozen or more clinical specialties to collaborate in arriving at a diagnosis and determining management.

Who does not learn, perhaps in an experimental laboratory, this lesson of team-work in the practice of medicine and the employment of consultations by a collaborating group will be much less than a good physician.

Persistent Routine

Research fosters a respect for persistent routine. Inspiration and glamour are not prominent in the continuing plodding which is demanded. The researcher patiently repeats the experiment again and again, week upon week, changing the procedure, perfecting the technique, analysing the failures, month after month doggedly pursuing the goal with no assurance of reaching it. There is an abundance of routine and boredom demanding inordinate tenacity to continue the venture. What thousands of dull red-blood-cell counts for long hours of many months provided the evidence to Whipple that liver accelerates red-blood-cell production in anaemic dogs! How many frog nerve–muscle preparations were carefully dissected by Helmholtz before he determined the speed of the nerve impulse!

Everyone who would contribute importantly to the world's work must learn this lesson of persistence in routine. The President of the United States must spend a lot of time writing his name. The concert pianist must practise alone for hours on end. The physician must percuss the heart borders of the hypertensive patient again and again. The medical student must laboriously repeat white-blood-cell counts on the patient with an infection.

The rewards of research or of medical practice demand countless unglorious hours of stubborn work as a routine, as might be found in the performance of many a less pretentious task than medicine.

Highway of Discovery

Research provides knowledge and familiarity with one of the highways of discovery. The study and reading essential in carrying out a research project, determining what has gone before in this area, and what yet needs to be done, are as different from the more casual reading of such material as actually travelling a countryside is different from reading a highway map. The gratification of such an excursion is intensified by the ultimate arrival at the end of the charted road where exploration into the unknown occurs.

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The discovery is usually very modest. Often it is a negative finding, the posting of a warning on a dead-end street. Yet it is a discovery, new knowledge, light into the darkness, a penetration beyond the frontier. Discovery, great or small, of what was never known before is an adventure to be cherished, an experience likely to colour a physician's entire outlook on his work. The physician who is imbued with the spirit of investigation, augmented by research experience, will be a little more persistent in his diagnostic searchings, in his therapeutic efforts, or in his self-evaluation.

Summary

Experience in research as a medical or graduate student may stimulate a continuation of some investigation throughout life. Even if the physician does no research after his formal education, his earlier experience in investigation will prove of tremendous value, because research sharpens the physician's judgments of the scientific pronouncements of others, it reveals the painful difficulty of discovery, it stimulates the pursuit of a scientific hobby. Research promotes an awareness of unobtrusive "accidental" phenomena which may be of great importance, it provides lessons in team-work, it fosters a respect for persistent routine.

Research acquaints the investigator and physician with one of the highways of discovery leading into the unknown.

THE VALUE OF PARTICIPATION IN RESEARCH IN THE CONTINUING EDUCATION OF THE PRACTISING DOCTOR*

BY

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Education is a continuing process which is dependent upon active studying. Without the critical application of one's mind to the subject, learning proceeds slowly and imperfectly and judgment is apt to be fallacious. The best of all study is when one applies one's energies to the elucidation of problems to which the answer is not known. This is usually called research. It is a broad field in which people with different types of talent may work successfully.

There are many ways in which research may be pursued. In all it is essential to know the background of the field of investigation, and in professional work this demands a sound knowledge of some aspects of one's field of practice and an awareness of the type of problems that may arise in it. It is always concerned with wondering, pondering, dreaming, and speculating about the subject. It always has to do with formulation of problems, sometimes in a broad philosophy, sometimes in a much narrower focus. The persistent endeavour to comprehend the background and the gropings to clarify the problem are all part of the search; and it is the searching that is important in education, not getting the answer. That some person may already have found the answer is not pertinent to the process of learning.

Medical people vary greatly in their essential interest in investigation. In some it is so keen that they are impelled to spend their lives either in experimental research or in the intensive investigations of disturbances of body and mind in health and disease. These usually stay in university centres, and any practice undertaken is as an associated and minor interest. Others make their living in various fields of practice; it is with them that we are concerned in this discussion.

It is a great mistake, however, to think that the habit of inquiring and the genius for searching are limited to those who devote their lives to organized research work. It is equally wrong to expect the busy practitioner to unearth many new facts or make striking advances. His searching is of a different intensity, spread at first over the broad area of his practice. Should he work in a university centre, and especially if he restricts his practice to a special field, it is easier for him to focus his attention on a specific problem, and often to work in association with laboratory colleagues. In more general practice the field is broader, but many have a largeness of mind capable of embracing a wide field in an intelligent survey. They must at first look at a whole landscape, but the scrutiny may lead to observations that demand focal study, sometimes with the help of others.

Research on Practical Problems

The practising doctor has many opportunities to engage in useful research work, but his accomplishments are likely to be restricted by lack of time to think about his problems and formulate them clearly. The more general his practice the greater is this difficulty. It is of first importance, therefore, that he study in a field that he knows, and that his projects be concerned with some aspect of his regular work. Just as teaching and research should not be separated, so practice and study should go hand in hand. Active studying stimulates the teacher, clarifies his ideas, and helps him gain a clearer vision of fundamental principles, making him a better teacher; in a similar way it stimulates the practitioner, sharpens his powers of observation, and throws light on his daily problems, making him a better doctor. Good habits of thinking, observing, planning, discriminating, and judging well are engendered and nurtured by persistent searchings; and these habits of investigation come to be used in all that one does. Their development requires constant application; hence they must arise and grow from daily use, the research becoming a concentrated effort in problems met with in his ordinary work.

A research hobby outside one's regular work is seldom helpful in education. To devote all his spare time to an extrinsic subject, such, for instance, as the study of tissue culture, actually tends to reduce a practitioner's interest in his patients and their disorders. If he has great talent for more fundamental research, however, it may lead him from practice into full-time research work in the field of his interest and aptitude. Banting taught physiology as a side interest when he began to do general practice after the first world war; the idea of a search for insulin soon took possession of him and changed his life's work.

The Continued Study of Patients

The pursuit of research in practice is not and should not be a separate component of a doctor's life. It is not like a coat that he puts on in moments of freedom

*An address given to the Second World Conference on Medical Education, Chicago, 1959.

from strain. It does not usually begin as a conscious effort in one field. It never comes with ease, but only after long effort and disciplined thinking. Problems for study become apparent to those who put their hearts in their work and work for the joy of it, who pursue their profession with unrelenting diligence and with an inquiring mind, willing to question established principles that do not satisfy the challenge of experience. These problems arise chiefly out of one's own experience and thought, although reading, discussion with one's associates, and the encouragement of talented colleagues may provide the initial stimulus and give continuous support to the work. "Clinical research ranges from the making of observations which are incidental to, and inseparable from, good practice, to systematic investigations undertaken deliberately and often over long periods with the object of answering specific questions. The former has always been an activity of good practitioners and, apart from seeing that it receives appropriate support, requires no special organization."[1] Its practice may, however, lead to the formulation of specific questions and the prosecution of more systematic research.

The question is often asked, How should a practitioner begin his study? It may be answered, to paraphrase Peabody's[2] famous remark about care of patients, by saying that the secret of the study of patients lies in studying one's patients. To further the study, however, there are certain practices to be followed and habits to be formed which, if persisted in, always have a good educational effect and commonly lead to useful advances in knowledge.

One has to do with the keeping of good records. The constant practice of describing symptoms, signs, and other important factors in concise, clear, and exact language enhances one's ability to recognize important findings and place them in proper perspective. It focuses one's attention on the more significant observations and provides the data for later examination and study.

Another is concerned with the habit of thinking and pondering over interesting findings, difficult problems, and striking phenomena. "Real thinking is an acquired skill founded on practice and habit, like playing a piano, and how well we can think at any given time will depend on how much of it we have already done. Nor can we think at random; we can only add one more idea to the body of something we have already thought about."[3] The process of thinking is facilitated by talking over our interests with competent, responsive colleagues and discussing our problems with them. The expression of our thoughts in conversation leads to clearer formulation of ideas in our own minds.

Such practices lead us to regard each difficult case as a problem which can be solved by data at hand or easily obtained, a practical research attitude which, if persisted in, will soon provide a rich background of knowledge. One begins to think and talk in terms of one's own experience, thus modifying knowledge based on reading and on the teaching of others. When one begins to describe his own results his methods of study are developing well.

The careful preparation of reports in clear appropriate terms is a necessary part of the discipline of research. It opens one's conceptions to exacting scrutiny and shows up the shortcomings and imperfections of observations and impressions. The examination of data and formulation of opinions comprise a constructive effort from which ideas arise to prepare the ground for making significant new observations.

As thoughtful and intelligent doctors pursue their practices, interesting differences become apparent in them. They do not all see a given patient in the same light. Manifestations that interest one and call for, even demand, his study pass unnoticed or little regarded by colleagues of apparently equal understanding and experience. This wonderful quality of awareness soon distinguishes the man with genius for research. It is partly inherent, depending on powers of association, memory, imagination, sagacity, and insight, but it flourishes only in fields well cultivated by long periods of study. Discoveries ascribed to chance are usually, perhaps always, due to the possession of this happy faculty of recognizing important observations. Considering this phenomenon from a different point of view, Cardinal Newman[4] spoke of the ability to make an instinctive just estimate of things as they pass before us as a quality "which sometimes indeed is a natural gift, but commonly is not gained without much effort and the exercise of years." It is a faculty which was exhibited with dramatic effect by Fleming when he recognized as important the inhibited zone around the colony of penicillium in the staphylococcus culture-plate. It has been demonstrated with less spectacular but still gratifying results by countless practitioners who have often gone on to pursue intensively the problems thus drawn to their attention.

Some Hindrances to Research

Perhaps the most deleterious of these influences is being too busy to have time to think, too weary and preoccupied to read or wonder. Being always in a rush and hurry tends to quench the sparks of imagination and inspiration, inhibit the powers of association, and dull the memory. The care of patients then becomes more and more a matter of routine, leaving little opportunity for learning. Actually it is easy under the best of circumstances to slip into mechanical procedures, for, as Ritchie[5] has said, "it is a standing temptation of mankind to put routine, which calls for no thought and little effort, in place of judgment, which calls for both." Development of judgment is essential for all good studying.

Almost as bad is to have a false conception of research: to think it can be done easily; that it is a matter of accumulating data from a series of tests and not, as it must be, an active discriminating process in one's own mind. What is done easily will neither answer important questions nor promote one's education. The failure to realize the need for hard disciplined thinking and constant scrutiny of one's observations and deductions is almost an insurmountable handicap. Those who fail to appreciate the difficulties in the way become easily discouraged, like obese patients on low-calorie diets who expect early dividends in reduction of weight without commensurate effort and determination in sticking to the regimen.

Other retarding influences include the attempt to do so much that little can be accomplished because of failure to restrict the focus of one's studies; the deviation of one's efforts to make use of expensive equipment and recording devices in the belief that the

use of these instruments is more scientific than the direct pursuit of one's problems by simple appropriate methods; and the desire for the glamour and prestige of research rather than for the interest, pleasure, and satisfaction of searching.

Opportunities for the Practitioner

The practitioner can follow the natural course of disease and its modification by all manner of influences: a huge field of unending interest and challenge. He can study the efficacy and dangers of new remedies. Every effective measure opens new avenues for research into the fundamental nature of the disorder affected. Each great advance raises far more questions than it answers, and opens doors for useful investigation to practitioners who can see the opportunities. Any clinical field in which there is nearly universal acceptance of current ideas is ripe for critical questioning and productive research.

The exact observations of Trousseau in the middle of the last century led him to doubt the value of blood-letting and other current measures used in treatment of people with strokes, and he ceased to use these methods because, as he said, "experience has taught me that patients do better without them." William Pickles, during his years of general practice in Yorkshire, in addition to throwing much light on the epidemiology of common infections, was the first in England to report cases of Bornholm disease.[6] Many similar examples of important contributions by practitioners of former and modern times could be cited did time permit.

But the great contribution of practitioners as a body cannot be cited in individual instances. They play a large if inconspicuous part in the advancement of medical knowledge. The accumulated good sense of a large number of thoughtful doctors has a wonderful influence: it dampens the excessive swings of medical fashion; buffers the over-enthusiastic claims for ill-founded methods of diagnosis and treatment; acts as the ultimate jury in clinical trials; and has a firm, strong educational influence.

The general principles of research methods and study are the same, no matter what the field. But techniques used vary greatly, and each must learn those appropriate to his problem. To produce much new knowledge requires virtually all the time of the investigator, allowing little opportunity for practice except in fields restricted to his special interests. But the critical research attitude of honest thinking and penetrating doubt on the part of the doctor in active practice is a catalyst which speeds up the learning process and gives new knowledge at a different but important level. It broadens his mind, increases his comprehension, and by its inherent discipline raises the standard of all aspects of his practice and of that of his closer associates.

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TREATMENT OF HAEMOLYTIC DISEASE OF THE NEWBORN DUE TO RH-IMMUNIZATION*

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In all cases where there are grounds for suspecting maternal Rh-immunization the first problem facing those responsible for the newborn infant is the prevention of death *in utero* or the birth of a child already gravely affected. At the present time it can be reduced to a decision whether or not to induce labour before term.

Induction of Labour before Term

We have adopted this term in place of "premature induction of labour," as the aim is in fact not to bring about the birth of a premature infant in the generally accepted sense of an infant weighing less than 2,500 g. It is well known that premature infants develop more severe and more prolonged hyperbilirubinaemia than do those born at term, and for this very reason are more exposed to the danger of kernicterus.

Except in cases of necessity, where obvious signs of foetal distress demand immediate intervention (which then becomes a heroic measure) we do not induce labour until everything has been done to establish that the infant weighs over 2,500 g. With this aim, we have made it a rule not to induce before the end of the eighth month. The stage of pregnancy, calculated from the last period, is, however, often misleading, and is by itself a quite inadequate criterion. An obstetric examination, carried out by a skilled obstetrician experienced in such cases, is essential, including a radiological examination, which we consider indispensable.

Another condition necessary if the induction of labour before term is to be harmless is the avoidance of other than purely mechanical methods—bougie or rupture of the membranes. Obviously, in cases where the obstetric condition does not appear suitable for intervention of this kind there must be no question of taking any risk; one should refrain from or at least postpone intervention, unless the urgency of delivering an infant clearly showing signs of distress, together with dystocia, makes caesarean section imperative.

As the efficacy of the treatment of haemolytic disease of the newborn is essentially preventive, it is important

*The pathogenic bases for the individual aspects of the treatment have been given in detail elsewhere (Jouvenceaux *et al.*, 1958), together with the results of 330 cases. These results, to which those for 1958 have been added, are summarized in the present paper, making a total of 399 cases.

that the infants to whom it is applied should be as little affected as possible, even if such infants are, by virtue of their birth before term, theoretically more exposed to the risk of subsequently developing a greater degree of jaundice, and hence are in more danger of kernicterus. The more the treatment of haemolytic disease of the newborn at birth and in the first days of life is perfected and increases in efficacy, the more induction of labour before term is justified in order to obtain a living infant, since, properly treated, such infants will recover.

This shows, however, that it is impossible to separate the induction of labour before term from efficient treatment of the newborn infant, the former being justified only by an assurance of the latter. This is the third condition which we consider essential if labour is to be induced before term.

In view of the possibility of unexpectedly severe manifestations in first affected infants, or when the titre of the maternal antibodies is low, we are of the opinion that in all cases where on serological evidence the child may be assumed to be Rh-positive, and where the foregoing conditions prevail, induction of labour before term may and should be carried out. Only when it is possible to estimate the degree of affection of the child *in utero* much more precisely than at present will there be any alternative. Hitherto, radiological examination of the foetus and examination of the excretion of 17-ketosteroids and pregnanediol in the maternal urine have given results only at a stage much too late to be of real value. Bevis (1952) and Walker (1957) have obtained interesting results with the electrophoretic study of amniotic fluid, but only before the 35th week, and in practice puncture of the amnion remains very difficult to carry out routinely and repeatedly. Observation of the reticulocyte level in the mother has been proposed by Kondi and Jacobescu (1958); in women carrying badly affected children we have confirmed his finding of levels differing significantly from those found in 100 "normal" women at various stages of pregnancy, but the sensitivity of the method appears poor.

Although we have accepted the principle of routine induction of labour before term, and have practised it from the start, there are nevertheless many among our observed cases where the woman presented at the maternity hospital only at the onset of spontaneous labour, on whom induction of labour before term could not be performed. In these cases we have had a death rate *in utero* of about 10%, over half of which occurred in the last two months of pregnancy. One may assume that a certain number of these deaths could have been avoided. We have compared (Table I) the incidence of the type of delivery, spontaneous or induced, among live-born infants in relation to the results of treatment.

By taking all the necessary precautions, we have had practically no disappointing surprises as regards the weight of infants delivered by induction of labour before term. Of 125 infants so delivered, 106 weighed over 2,500 g. and therefore did not fall within the definition of premature (of these 106 infants, two-thirds were over 3,000 g.), and 19 weighed between 2,000 and 2,500 g.; among the latter there were cases with distinct obstetrical signs (renal symptoms) and cases with an extremely bad history or signs of foetal distress.

TABLE I.—*Influence of Method of Delivery Among Live-born Infants*

	Total	Deaths	Kernicterus	Recoveries
Delivered by spontaneous labour	236	33 (10 from kernicterus)	21	192 (81%)
Delivered by labour induced before term*	125	7 (none from kernicterus)	3	115 (92%)

*Or, exceptionally, by caesarean section.

The total results thus appear better in infants delivered by induction of labour before term; however, the above comparison is open to criticism. On the one hand, a small number of the infants delivered spontaneously were not seen immediately after birth, and, on the other, in the group of children delivered by induction of labour before term there are a greater number of cases where there was a previous history or the maternal serology gave cause for anxiety. In an attempt to examine two comparable and *a priori* severely affected groups of infants differing only in the manner of delivery, we have selected only infants born alive, with one or more elder sibs dead either *in utero* or in the neonatal period from haemolytic disease of the newborn due to Rh-immunization; we retained only infants known before birth to be exposed to danger and consequently treated with equal promptness.

TABLE II.—*Influence of Method of Delivery Among Live-born Infants Having at Least One Elder Sib Dead from Haemolytic Disease of the Newborn Due to Rh-immunization and Treated Promptly*

	Total	Deaths	Kernicterus	Recoveries
Delivered by spontaneous labour	26	7 (26·9%)	0 (0%)	19 (73%)
Delivered by labour induced before term	51	3 (5·9%)	2 (3·9%)	46 (90·2%)

It is clear from Table II not only that the induction of labour before term has enabled us to prevent deaths *in utero* towards the end of pregnancy, sometimes in the final stages (Gaucherand *et al.*, 1952), but that even in the case of live-born infants the degree of affection is less when labour has been induced before term. This corresponds to the fact that the severest pictures at birth are encountered most often in infants delivered spontaneously.

Although it has been possible in the past to accuse induction of labour before term of increasing the number of cases of kernicterus—as indeed would appear from Table II—the criticism is now without foundation, since we know how to avoid this complication. Since May, 1954, observation of bilirubin levels has, as is explained below, guarded against kernicterus. From this date, in 13 women bearing an Rh-positive child still alive at the end of the eighth month, who had previously had at least one death *in utero*, induction of labour before term enabled us to obtain 13 living children and 13 complete recoveries.

Prompt Exchange Transfusion

Criteria

We have adopted broad criteria for carrying out exchange transfusion immediately after birth; in establishing them, regard was paid both to clinical and to laboratory information. Faced with even one clinical sign of affection, we carried out the treatment at once. In cases where the infant showed no clinical signs at the moment of birth, the results of the laboratory investigations were interpreted cautiously.

Serological tests, whether on the mother or on the infant, are of diagnostic value, but only to a much less degree are they prognostic. In cases where the haemoglobin is low, clinical evidence will already have indicated as much; where it is normal it is known to be deceptive. Walker and Mollison (1957) state that 40% of infants dying from kernicterus had a cord haemoglobin above 15 g./100 ml. Erythroblastaemia and reticulocytosis are no more reliable as a guide. The information supplied by the cord bilirubin level is somewhat of the same order as that supplied by the haemoglobin: a high level tells us nothing, and it is not uncommon for a low one to rise later to a dangerous level.

It is possible that indications drawn from the pigment "heme" of Abelson and Boggs (1953) may have a greater accuracy.

In practice, we have invariably carried out exchange transfusion on infants with a positive direct Coombs test, except in cases where the six following conditions prevailed: absence of any clinical signs, infant weighing over 3,000 g., absence of previous history, satisfactory cord data (Hb above 15 g., bilirubin below 3 mg.), serological findings giving little cause for alarm (titre of maternal antibody below 1/32), and the assurance of adequate supervision by means of bilirubin estimations.

Our criteria have thus been wider than those of Boggs (1956), who, relying on the cord level of the pigment "heme," was able to refrain from intervention in 30% of erythroblastotic infants, and also than those of Walker (1958), who considers that the information supplied by the cord blood haemoglobin and bilirubin levels is in practice by itself sufficient to distinguish at birth infants who need (or will need) transfusion and those (40%) for whom no treatment will be necessary. In our own series only 10% of the infants seen at birth with a positive direct Coombs test recovered without treatment.

In the case of infants seen at birth, however, it is the immediate necessity which must be decided: we do not believe that the initiation of hourly bilirubin estimations constitutes a valid reason for delaying immediate exchange transfusion in cases where it is not independently demanded by the clinical condition. By delaying there is a risk of depriving the infant of the advantage of prompt exchange transfusion, which would prevent the haemolytic crisis that comes immediately after birth. Moreover, bilirubin estimations performed on small samples of capillary blood cannot be accurate enough to allow the rise which occurs in a few hours to be followed precisely. Finally, even if it is possible to appreciate the rate of the rise (which reveals the intensity of the haemolysis), its duration, which is a function of the efficiency of the eliminating processes in any given case, can hardly be foreseen. Cases do occur where a rapid increase ceases abruptly, and, conversely, where a slow rise later becomes dangerous. Although the highest serum bilirubin levels are generally attained in infants with the highest cord bilirubin levels, it is also true that the premature infant often has a low cord level but a prolonged rise later. The criteria of cord blood may thus lose some of their value in infants born before term, and the practice of induction of labour before term may lead one to the necessity of treating a greater number of infants. We do not, however, think that this inconvenience can be weighed against the reduction in general mortality effected by it.

Blood Used for Transfusion

The blood used was in all cases of the same ABO group as the infant, and non-antigenic—that is, free from the antigen, usually Rh (D)—to which the mother was immunized. An examination of the mother's blood is thus implicit. There was, however, one exception in the case of a newborn infant admitted several years ago by a paediatric unit, when the mother's blood was not available. The child was referred as a case of haemolytic disease of the newborn, and, in addition to showing very suggestive clinical signs, was Rh-positive and had a positive direct Coombs test. It died during an exchange transfusion carried out urgently with Rh-negative blood. When later it became possible for us to obtain a sample of the mother's blood, she was found to be Rh-positive C/CDe, with an anti-c antibody. Since then she has borne two more affected children, on whom we have carried out exchange transfusions using Rh-positive (C/C) blood, and both of whom have recovered completely.

We use stored blood, as being more readily available, selecting bottles taken not more than three days previously, which have had time to settle. An amount of citrated plasma, equal to one and a half times the amount of acid-citrate-dextrose solution in the bottle before taking the blood, is drawn off. This allows us to inject somewhat less blood than is withdrawn, and thus to avoid or correct any circulatory overloading, while still relieving the anaemia. On an average, we thus create, at the beginning of the exchange transfusion, a deficit of 10 ml. per kg. of body weight, and sometimes more in cases of dyspnoea or cyanosis with raised venous pressure.

We believe that it is of value to use heparinized blood for the exchange; any risk of coagulation is thus avoided, and, more important, it provides an opportunity of adding directly to the bottle the calcium necessitated by the use of citrated blood. Electrocardiographic studies carried out by Gustafson (1951) by Furman, *et al.* (1951), and Joos *et al.* (1954) during the course of exchange transfusions, and those of Berliner (1936) after the injection of calcium, show on the one hand the dangers of hypocalcaemia and on the other those of massive injections of calcium. We therefore add 2.5 mg. of heparin followed by 1.5 ml. of 10% calcium gluconate to each 100 ml. of blood. At the end of the exchange the heparin remaining in the infant's circulation (about 5 mg.) is neutralized by the addition of 0.5 ml. of 1% protamine sulphate to the last few millilitres of blood given.

The amount of blood used for the exchange is based on the body weight of the infant or, more accurately, on its total blood volume, this being calculated as one-thirteenth of the body weight. Although in our first cases this amount was two to three times the total blood volume, we have received the impression that better results were obtained when four times the total blood volume was given, although it is difficult to produce clear statistical evidence for this. Whenever the state of the child permits, the latter is the amount used. There are, however, cases where, faced with a disturbing picture, one is obliged to confine oneself, as an emergency measure, to the correction of the anaemia and the reduction of the blood volume, and to attempt a complete exchange only in several stages.

The blood is warmed before and during the exchange in a water-bath at 37° C., and in addition the infant is

kept during the operation in a special thermostatically controlled incubator (Jouvenceaux, 1958).

Technique of Exchange Transfusion

In the 418 exchange transfusions which we have carried out on newborn infants with haemolytic disease of the newborn caused by both Rh- and ABO-immunization, and also in cases where there was no blood-group incompatibility, we were able to use the umbilical route in all cases, except 13 (3%) in which we were obliged to cut down on the saphenous vein in the thigh. Often we were able to use the umbilical route on children over 4 days old, on premature infants (among them one weighing 900 g.), and up to three times on the same infant.

The efficacy of the exchange transfusion of a given amount of blood depends both on the capacity of the tubing from the syringe to the infant and on the amount of blood mobilized by each individual exchange. For this reason we have the syringe as near as possible to the umbilicus and use a 23-ml. syringe. The successive withdrawal and injection of this amount is perfectly well tolerated in the great majority of cases, but it may be reduced if the infant is small or if pallor develops on the withdrawal.

The speed of the operation also depends on the child's condition and its state during the exchange. Although for a long time we completed most of our exchanges in one hour, we have now adopted a slower rhythm.

Risks of Exchange Transfusion

It is impossible to reproduce the results of immediate exchange transfusion in figures, since it is not possible to compare the results obtained in infants who were so treated with those who were not, as the latter consists of infants either seen only at a late stage or who showed a mild affection, where intervention was not indicated. It is, however, possible to examine the risks of accidents during the operation.

In our 418 cases there were 14 deaths during or at the end of the operation, but an analysis of these cases shows that very few can be attributed to it. Among the 14 were a set of triplets whose four elder sibs had died from haemolytic disease of the newborn, three cases of hydrops, three cases of kernicterus, and one child delivered by caesarean section who had required resuscitation before the exchange. Another infant, already mentioned, died during an exchange carried out with Rh-negative blood, when the haemolytic disease of the newborn was in fact due to anti-c. Two others, rather heavily anaemic, died at a stage when the amounts of blood withdrawn were not greater than those injected. Finally, one infant died during the exchange transfusion of stored blood over one week old.

In no case was there post-operative infection or thrombosis. For a short period, however, we did encounter post-transfusional haemorrhages, and were led to wonder whether they had a connexion with the large amounts of blood—over three times the total blood volume—which we had begun to use at that time. In three infants who had not previously shown any haemorrhagic tendency exchange transfusion was followed, some 24 hours later, by purpura, prolonged bleeding at the sites of injection, or intestinal haemorrhage, the latter being followed by rapid death with a picture corresponding to that of cerebromeningeal flooding, although necropsy for the purpose of confirming this could not be performed.

We then carried out blood-coagulation tests on a series of infants treated by exchange transfusion. A reduction in the number of the platelets, previously reported after exchange transfusion or massive transfusion (Krevans and Jackson, 1955; De Bruijne *et al.*, 1956) was found. However, we have never found a thrombocytopenia severe enough by itself to explain the bleedings; in no case has the platelet count been below 50,000 per c.mm. But it is possible for massive exchange transfusion to have other consequences in the newborn besides a lowering of the platelet count. The most striking complication which we have met is hypoprothombinaemia, and especially hypoproconvertinaemia, which must have been present before the exchange, with proconvertin times reaching 300 seconds when normal controls were giving times of 60 seconds. A state of hypoprothrombinaemia and hypoproconvertinaemia is physiological in normal newborn infants (Loeliger and Koller, 1952; Van Creveld, *et al.*, 1954) and is exacerbated by haemolytic disease of the newborn. It is generally largely corrected by the compensating effect of a great number of thromboplastic factors of placental origin, as Larrieu *et al.* (1952) and Masure and Schonne (1956) have shown. Under these conditions massive exchange transfusion could have the effect of temporarily correcting the two deficiencies for about 24 hours only, after which they would reappear rapidly, while at the same time draining off the compensating thromboplastic factors which would until then have protected the infant.

Since then all infants receiving exchange transfusion have been routinely treated with vitamin K_1, and we have been able to carry out 204 exchanges, normally involving over four times the total blood volume, without the appearance of any bleeding.

We have not used "synthetic" preparations of vitamin K, which are much less effective and which have been said to increase hyperbilirubinaemia and encourage kernicterus (Allison, 1955; Moore and Sharman, 1955; Crosse *et al.*, 1955; Meyer and Angus, 1956; Bound and Telfer, 1956). Allison *et al.* (1956) and Marusich *et al.* (1956) have shown that in rats deprived of vitamin E, haemolysis with haemoglobinuria can be induced by intramuscular injection of several synthetic preparations of vitamin K but not by the injection of vitamin K_1.

Control of Bilirubinaemia, and Drainage by Exchange Transfusion

Until May, 1954, once exchange transfusion had been carried out at the earliest possible moment, subsequent supervision was in practice limited to clinical observation and control of the haemoglobin. The direct Coombs test had generally been rendered negative as a result of the exchange, and the erythroblastaemia brought within fairly normal limits. From this date, however, a daily estimation of the serum bilirubin has been performed routinely on all infants by a micromethod requiring the use of only a small amount of capillary blood (Jouvenceaux and Revol, 1957) and any showing hyperbilirubinaemia above 20 mg./100 ml. of serum have been regarded as requiring drainage by exchange transfusion.

Results during these two periods on infants coming into our hands, either immediately after birth or at any rate before the appearance of kernicterus, are given in Table III.

TABLE III.—*Incidence of Kernicterus and Death Before and After Initiation of Regular Bilirubin Estimations (May, 1954)*

	Live-born Infants Seen Before Appearance of Kernicterus	Kernicterus	Deaths	Recoveries
Before May, 1954	74	9 (12%)	12 (16%)	74·3%
After May, 1954	272	0 (0%)	20 (7%)	93%

A contrast is furnished by infants coming into our hands after May, 1954, with kernicterus already established and having bilirubin levels known or assumed to be well above 20 mg. We have on no occasion seen kernicterus following "direct" bilirubinaemia with levels reaching 30 mg. or lasting for a month which was not accompanied by "indirect" bilirubin levels above 20 mg.

Drainage by exchange transfusion is effective only to a relatively small extent, since the exchange affects only the blood, while bilirubin is diffused throughout the tissues. For this reason it is important to carry out the operation slowly, taking at least two hours and using large quantities of blood. We have found by experience that at the end of an exchange performed under these conditions the blood withdrawn in the last syringe still contains considerable amounts of bilirubin. The effectiveness of the tissue drainage effected by slow and massive exchange transfusion is apparent if the calculated amount of circulating bilirubin before draining is compared with that found in the total amount of blood withdrawn. We have found that the total quantity of bilirubin withdrawn is at least double that previously circulating in the infant's blood, and may be up to four times this amount.

The marked decrease in kernicterus in haemolytic disease of the newborn due to Rh-immunization, following regular bilirubin estimations and the effectiveness of drainage by exchange transfusion have led us to observe and treat all cases of profound jaundice occurring in the neonatal period in this way.

One wonders whether there will in the future be a better method than drainage for reducing a dangerous hyperbilirubinaemia. This would presuppose some action on the enzymatic processes which at the hepatic level transform bilirubin into the form in which it can be eliminated—that is, direct glycuro-conjugated bilirubin. These processes are temporarily deficient at birth in the normal and to an even greater extent in the premature infant. The substances—sulphobromophthalein (Yudkin and Gellis, 1949; Obrinsky *et al.*, 1952) the corticosteroids (Bongiovanni *et al.*, 1958), and bilirubin (Grodsky *et al.*, 1958; Brown and Zuelzer, 1958)—which are known to require glycuro-conjugation before elimination, are eliminated more slowly at birth, and the excretion of glycuronides is diminished during this period (Brown, 1957). It still remains to determine whether it is the glycuro-conjugation mechanism which is deficient, or any of the vital intermediate stages.

An extremely slow rate of elimination of bilirubin (and also of the corticoids) appears to be very frequent in thyroid insufficiency. The frequency with which prolonged neonatal jaundice, which may result in kernicterus, occurs in congenital myxoedema has been pointed out by Åkerrén (1954), Christensen (1956), and Bialkin and Harris (1958). It is quite conceivable that this congenital condition may cause late maturity of the organs. Conversely, where this immaturity exists as in the premature infant, it has been found that ^{131}I fixation is lower than in the full-term infant (Van Middlesworth, 1954; Martmer *et al.*, 1956). It therefore appeared logical to look for some stimulating action of the thyroid hormone on enzymatic processes still insufficiently developed at birth, and we have recently been trying this line of approach in cases of neonatal jaundice not accompanied by exaggerated haemolysis. We are not at the moment in a position to draw any conclusions.

Additional Treatments

The only additional treatment which we use is the routine administration of 100,000 units of penicillin per kg. of body weight after exchange transfusion, and half an ampoule of vitamin K_1 a day intramuscularly during the first three or four days.

After transfusion, using blood with a high haematocrit, anaemia reappears only slowly and in a very small number of cases. We ourselves never give prophylactic anti-anaemic treatment, as this is often badly tolerated by the digestive system and is usually of no value. Under these conditions, in about 7% of infants treated by exchange transfusion we have been obliged to give one injection of packed red cells, usually round about the age of one month.

A condition which may occur, as in 52 of our cases, is the "inspissated bile syndrome," clinically evident in varying degrees and invariably revealed by the presence of a strong "direct" bilirubinaemia. It may also be observed in two forms: present at birth, it usually accompanies severe affection with a wide symptomatology; and, appearing later, it may assume a form which is not particularly severe, perhaps with a familial predisposition. The most usual consequence is the prolongation of jaundice, but not of jaundice leading to kernicterus. Is it possible that the condition may lead to affection of the hepatic cells? We are of the opinion that if this is so it would pre-exist at birth, and would be seen only in the very severe cases, where the syndrome is present from the start. We have seen one such case where the child died at 2 weeks, with a picture reminiscent of cirrhosis. It is for cases such as these that there may be some indication for the use of cortisone; in less severe cases we have been able to obtain some improvement with one tablet of icteryl daily.

Conclusion

The treatment of haemolytic disease of the newborn has grown steadily in effectiveness and is continuing to do so. It is certain the existence of a previous history worsens the prognosis of a given case, but even in these cases there is now a high percentage of recoveries. Since May, 1954, we have seen 74 women with at least one previous child dead, either *in utero* or after birth, from haemolytic disease of the newborn due to Rh-immunization, who were pregnant with a further Rh-positive child. Among these 75 infants (one case of twins) our results have been 16 deaths *in utero* (21%), 3 deaths immediately following birth (4%), and 56 complete recoveries (75%).

The above shows that the real therapeutic problem of haemolytic disease of the newborn due to Rh-immunization is now one which arises before delivery, and to which the answer consists in obtaining a live

infant, viable for the first few hours, which will then have every chance of recovery.

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Toothbrushes have been issued at a cost of threepence each to children in 170 schools of Fiji's main island of Viti Levu in a campaign to encourage children to preserve their teeth. At each school the children brush their teeth every lunch-time under the supervision of a teacher. The brushes they are using have been bought in bulk by the dental section of the Medical Department. Some of the children now brushing their teeth every day had never used a toothbrush before. It is hoped that they will get into the habit of cleaning their teeth at home as well as at school, and that, through them, parents who are not in the habit of cleaning their teeth will learn elementary dental hygiene. It is aimed, eventually, to introduce the scheme into every school in the islands.

BIOSYNTHESIS OF CHOLESTEROL IN FAMILIAL HYPERCHOLESTEROLAEMIC XANTHOMATOSIS

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Hypercholesterolaemia occurs in pregnancy, hypoparathyroidism, the nephrotic syndrome, obstructive jaundice, and diabetes, as well as in a number of relatively rare familial conditions of unknown aetiology. When persistent the condition is often associated with xanthomatosis, and the forms of the disease which are not secondary to some known disorder have been extensively studied by Thannhauser (1958). The mechanism whereby the concentration of cholesterol in the plasma is maintained at a higher level than normal is unknown, although experiments with labelled acetate have suggested that in some cases increased biosynthesis from acetate may be responsible.

Cholesterol is synthesized from acetate units in the body (Bloch and Rittenberg, 1942), and a number of workers have investigated the incorporation of labelled acetate into the plasma cholesterol of patients with a variety of conditions associated with hypercholesterolaemia (Hellman, Rosenfeld and Gallagher, 1954; Hellman, Rosenfeld, Eidinoff, Fukushima, Gallagher, Wang, and Adlersberg, 1955; Gould, LeRoy, Okita, Kabara, Keegan, and Bergenstal, 1955). The present paper describes a similar investigation of a patient with familial hypercholesterolaemic xanthomatosis. It has been shown that in this patient the biosynthesis of free cholesterol and its turnover rate are greatly increased, although the rate of esterification is normal.

Clinical History

The patient was an engineer aged 36. In 1943 he had a thyroidectomy which left him with some hoarseness. In 1953 he was investigated for a blackout and gave a history of continuous tinnitus for the previous 12 months and the development of small nodules on the back of the hands for the previous three months.

Examination showed him to be a tall and well-built man, with a dry skin, heavy features, and a slow and husky voice. Blood pressure was 130/90 mm. Hg and the pulse rate 60 a minute. The heart and lungs were normal. The blood count was normal. Chest *x*-ray examination revealed no abnormality. Laryngological examination showed paralysis of the right vocal chord; the tinnitus was found to be central and fixed. The electrocardiogram showed depression of the ST segment and inversion of the T_3, suggesting myocardial damage. The B.M.R. was −38% of normal. The plasma cholesterol was 860 mg./100 ml., and a biopsy

of a nodule from the extensor tendon of the left wrist showed xanthomatosis of the tendon sheath.

After treatment with thyroid extract the E.C.G. returned to normal; the B.M.R. increased to +7% of normal, but the plasma cholesterol remained elevated at levels varying from 345 to 600 mg./100 ml.

The patient's mother and one of his brothers had hypercholesterolaemia and both died from cardiac infarction. The present case was therefore diagnosed as familial hypercholesterolaemic xanthomatosis complicated by myxoedema.

Methods

Plan of Experiment.—200 μc. of sodium 2-^{14}C acetate (Radiochemical Centre, Amersham, Bucks) was dissolved in 100 ml. of tap-water, and given by mouth after overnight fasting. The receptacle was washed out 10 times by further 10-ml. quantities of water, which were also swallowed by the patient. 10-ml. samples of blood, with potassium oxalate as anticoagulant, were collected from the antecubital vein at 4, 8, 12, 24, 48, 72, 96, 120, and 144 hours after the radioactive material had been given.

Analytic and Preparative Methods. — Total plasma cholesterol was estimated by the method of MacIntyre and Ralston (1954). Samples of cholesterol digitonide were prepared from the free and ester fractions of each of the specimens by the method of Hellman *et al.* (1954) except that excess pyridine used for dissociating the preliminary cholesterol digitonide precipitate was removed by washing the ethereal extract with 2N HCl and with water.

Radioactivity Measurements. — The radioactivities of weighed amounts of the separated free and ester cholesterol digitonides were measured on 1-sq. cm. polyethylene planchettes with a Geiger–Muller counter having a mica end-window of about 2 mg./cm.^{2} thickness. The efficiency of the system was 4.2%, as shown by a standard ^{14}C polymethylmethacrylate solid source. The counts were corrected for background (approximately 7 cpm). Insufficient material was obtained for counting the separate specimens at infinite thickness; the observed counts were therefore corrected to infinite thickness, using a calibration curve obtained by measurements with pooled specimens of radioactive digitonide. Standard deviations of the specific activities of the free fraction varied from ±4% at four hours to ±16% at 144 hours, at which time the activity was very low, and of the ester fraction from ±20% at four hours to ±7% at 144 hours. The specific activity of the cholesterol was calculated from that of the digitonide by multiplying by the factor $4.1 = \frac{1616}{387}$.

Results

Fig. 1 shows that the peak specific activity of the free cholesterol fraction had already been reached within the first four hours, at which time the specific activity was 0.44 μc./g. The specific activity of the free cholesterol decreased rapidly between 4 and 24 hours after administration of the labelled acetate, and then more slowly until the end of the experiment. The specific activity of the ester fraction increased slowly, becoming equal to that of the free cholesterol (0.076 μc./g.) at about two and a half days, after which time the values for the ester fraction exceeded those of the free fraction. The specific activity of the ester fraction reached a maximum of 0.083 μc./g. at about four days, and then slowly decreased.

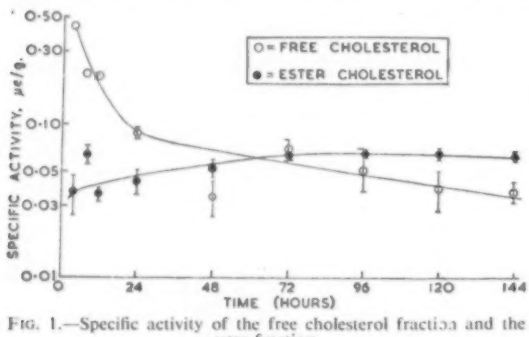

FIG. 1.—Specific activity of the free cholesterol fraction and the ester fraction.

Discussion

The biosynthesis of plasma cholesterol from ingested labelled acetate is a complex process involving absorption of the acetate (probably complete within half an hour), admixture of the labelled acetate with the body pool of the compound, and the synthesis of cholesterol via an unknown number of intermediaries, including acetyl coenzyme A, mevalonic acid, and a C_{30} sterol lanosterol (Popják, 1958). Cholesterol biosynthesis accounts for only a small fraction of the ingested acetate, the greater proportion of which is metabolized not only by katabolism to carbon dioxide, but also via other pathways, including synthesis of fatty acids, glycogen, purines, and porphyrins.

Incorporation of ^{14}C-acetate into Plasma Cholesterol

Although the dose of tracer was small enough not to disturb the steady state which the constancy of the plasma cholesterol showed to be present in our subject, the complexity of the pathway of biosynthesis and the presence of at least two metabolic pools of cholesterol in the plasma and liver, respectively, prevent any meaningful interpretation of the pool sizes calculated from our results. For a similar reason the total percentage of the labelled acetate converted to cholesterol cannot be determined, although the percentage of this administered dose converted into the *circulating* plasma cholesterol at any one time can be calculated from a knowledge of the specific activity of the cholesterol at that time, the concentration of free and ester cholesterol in the plasma, and the plasma volume in the subject.

The results of the calculations are shown in the Table, which also shows the results obtained by Hellman *et al.*

Results of Calculations

Subject	Time	Percentage Administered Dose of ^{14}C in Circulating Plasma		
		Free Cholesterol	Ester Cholesterol	Total Cholesterol
(Present patient)	4 hours	2·0	0·17	2·17
Essential hypercholesterolaemia	8 ,,	1·0	0·29	1·29
Weight, 84 kg.	12 ,,	0·90	0·17	1·07
Free cholesterol,	24 ,,	0·40	0·20	0·60
238 mg./100 ml.	2 days	0·16	0·25	0·41
Ester cholesterol,	3 ,,	0·31	0·29	0·60
247 mg./100 ml.	4 ,,	0·23	0·31	0·54
	5 ,,	0·17	0·30	0·47
	6 ,,	0·16	0·29	0·45
Xanthoma tuberosum	3 hours	2·3	0·125	2·43
Patient of Hellman	8 ,,	2·2	0·375	2·58
et al. (1955)	19 ,,	1·85	0·6	2·45
Weight, 52 kg.	1·73 days	1·5	0·385	1·89
Free cholesterol,	2·73 ,,	1·03	1·03	2·16
301 mg./100 ml.	4·73 ,,	0·74	1·205	1·95
Ester cholesterol,	10·73 ,,	0·48	0·905	1·39
511 mg./100 ml.				
Carcinoma of breast	3 hours	1·1	0·33	1·43
Patient (A.C.11) of	10 ,,	0·61	0·67	1·28
Hellman *et al.*	20 ,,	0·47	0·75	1·22
(1954)	1·33 days	0·405	0·865	1·27
Weight, 44 kg.	1·85 ,,	0·32	0·95	1·27
Free cholesterol,	2·33 ,,	0·325	0·87	1·20
61 mg./100 ml.	2·85 ,,	0·29	0·81	1·10
Ester cholesterol,	4·0 ,,	0·25	0·655	0·91
155 mg./100 ml.	9·0 ,,	0·135	0·43	0·58

(1954, 1955) in a patient with xanthoma tuberosum, nephrotic syndrome, and a patient with carcinoma, in whom cholesterol metabolism is presumed to be normal. The percentage of administered radioactivity incorporated into the circulating plasma cholesterol is 2.17 at four hours. At this time, 92% of the circulating radioactive cholesterol is in the free fraction, and it is the considerable fall in the radioactivity contained in this fraction which results in the percentage of administered radioactivity in the total circulating cholesterol falling at about eight hours to 1.29, and then declining more slowly until the end of the experiment.

Other workers who have carried out similar investigations in human subjects have not made calculations in quite this way, but it is possible to do so from the detailed results presented by Hellman *et al.* (1954, 1955). Gould *et al.* (1955) have calculated the percentage of their administered radioactivity in the total liver and blood cholesterol, making certain assumptions regarding the amounts of free and ester cholesterol in liver and plasma based upon their observations in the dog. It is possible to calculate figures analogous to those in the Table from their results, making assumptions only in regard to the amounts of free and ester cholesterol in the circulating plasmas.

The maximum percentage incorporation into the circulating cholesterol in our case is higher than that observed in any of the others recorded, with the exception of the one of xanthoma tuberosum studied by Hellman *et al.* (1955), in which a maximum figure of 2.58 was attained. In the other cases studied by Hellman *et al.* the maximum percentage incorporation varied from 0.48 to 1.41, while in Gould's cases, even after multiplying by the factor 1.25 to account for their use of 1-^{14}C acetate (Little and Bloch, 1950), the maximum percentage incorporation calculated from their results varied from 0.25 to 0.64. In the present case and in the one of xanthoma tuberosum there is thus evidence of an abnormally high proportion of acetate converted to cholesterol, and, since the peak of incorporation seems to have been reached within four hours, this can only mean an unusually high rate of biosynthesis.

This is supported by the subsequent decline in percentage incorporation of radioactivity in the free fraction ($T_{\frac{1}{2}}$ = 4 hours—see below), which is more rapid than in any of the other published cases ($T_{\frac{1}{2}}$ = 4.8 to 11 hours) and is probably due to the replacement of labelled cholesterol by newly synthesized unlabelled cholesterol.

In the present patient this is clearly a higher rate of biosynthesis than normal. This would be expected to result in an earlier peak of specific activity, but unfortunately we had no opportunity of investigating samples of blood before four hours after the labelled acetate was ingested.

Exponential Components in the Decline of Specific Activity of Plasma Cholesterol

As in previous work in this field, the early exponential component ($T_{\frac{1}{2}}$ = 4 hours) of the fall in specific activity of the free cholesterol with time is followed by two further components with $T_{\frac{1}{2}}$ of 26 and 110 hours, respectively (Fig. 2). Hellman *et al.* have interpreted the three exponential rates of disappearance of labelled cholesterol from plasma as due to (1) the conversion of acetate to cholesterol, (2) the mixing and distribution of newly synthesized sterol, including such processes as esterification and the distribution of labelled sterol from the plasma to the tissue, while (3) the slowest exponential component was alleged to describe the turnover of cholesterol after the initial rapid processes had been

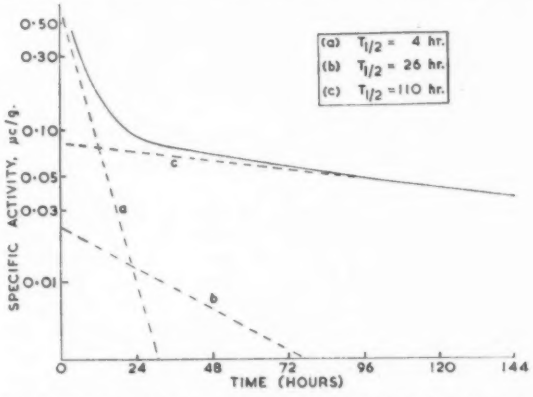

FIG. 2.—Exponential rates of disappearance of labelled cholesterol from plasma.

completed. Presumably the last includes the slow return of labelled cholesterol from the tissues to the plasma. They emphasized, however, that these interpretations required confirmation by other methods. Such an explanation may be applicable to our own case, but the slower exponential curves would be reduced in magnitude by the particularly rapid turnover of plasma cholesterol.

It seems to us that these interpretations do not take into account the biosynthesis of cholesterol from labelled acetate made available slowly from pools such as of glucose, glycogen, fatty acids, or even protein, labelled at the time of the acetate feeding. The second component may well be due to the continued production of labelled cholesterol from such pools of acetate precursors not in the direct pathway of synthesis of cholesterol. The third exponential component could arise from the mechanisms suggested by Hellman *et al.*, or be due to production from yet another precursor or perhaps even from the hydrolysis of the labelled ester cholesterol.

Relation Between Specific Activity of Free and Ester Plasma Cholesterol

In contrast to the early maximum specific activities obtained within four hours by the free cholesterol, the

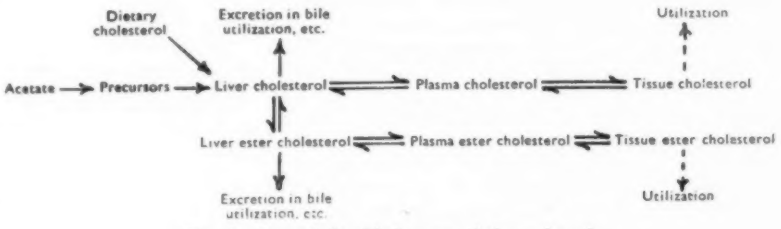

FIG. 3.—Interrelationship between cholesterol pools.

specific activity of the ester cholesterol does not reach its maximum until about four days, by which time the specific activity of the free cholesterol was declining along its third exponential component. Formation of the labelled free cholesterol clearly precedes that of the esterified form, and indeed the relationship between the specific activities of the free and ester fractions fulfils the criteria of Zilversmit, Entenman, and Fishler (1943), that the free cholesterol is the precursor of the ester sterol. However, the parallelism between the two final declining curves might also be due to transfer of ester cholesterol from plasma or tissues to the liver, where it is hydrolysed, mixed with newly formed free cholesterol (Fig. 3), thus diluting its specific activity, and the mixed cholesterol then equilibrating with the free cholesterol of the plasma.

Hellman *et al.* regard equilibrium in normal subjects as reached at 2.0 days—that is, the crossover point of specific activity—and regard it as the time taken for esterification of the newly synthesized cholesterol. In their case of xanthoma tuberosum, the point of intersection was at the sixth day, and in our case it was the third day because of the unusually large fall in radioactivity of the free fraction. As they comment, however, there is no true equilibrium; indeed, the difference in the time of the two peaks is a much better index of the time taken for esterification. Our own experiments were not continued long enough, but those of Hellman *et al.* show that during this time the specific activity of the ester cholesterol at any one time is about the same as that of the free cholesterol two to three days previously. This also agreed with the time taken for esterification as judged by the difference in the time of the two peaks. This is two to three and a half days in their cases, but four days in our own.

In the cases of Hellman *et al.*, at the time when the specific activities of both free and ester cholesterol were identical, the total percentage of administered radioactivity present in the plasma cholesterol had not appreciably changed from that measured 0.3 day after administration of labelled acetate. This contrasts with the results obtained from the present case in which the total percentage of administered radioactivity present as plasma cholesterol falls rapidly during the first 24 hours. This fall was mainly due to the failure of the radioactivity of the ester cholesterol to increase sufficiently. This could be due to a variety of reasons, such as esterification in the liver with subsequent dilution with an enlarged pool of unlabelled ester cholesterol as was not unlikely in our patient. However, the low maximum level of the specific activity of the ester cholesterol (which is of about the same value as found in normal subjects, despite the high peak activity in the free fraction) is probably due to a relatively slow rate of esterification rather than to dilution by an enlarged pool, because the peak activity of the ester is so late. Since the percentage conversion to ester cholesterol is disproportionately low, there must be an increased utilization of free plasma cholesterol via other pathways such as by excretion or metabolism.

Conclusion

Because of the complexity of the system, it is impossible to identify the turnover rates and sizes of the pools calculated from Fig. 2 with the processes and pools outlined in Fig. 3, but there is no doubt that, in our case, biosynthesis of free cholesterol and its turnover rate are greatly increased above normal. It is possible that this increased rate of biosynthesis is due to more acetate being available for cholesterol synthesis because less was being used along the main pathway of the tricarboxylic acid cycle—glycogen or fatty acid synthesis associated with myxoedema. The patient had been treated with thyroid extract for two years, and this treatment was continued during the present investigation and maintained the B.M.R. at +6%. The rate of esterification does not seem to be obviously increased, so that the increased rate of removal of plasma-free cholesterol seems to be via other pathways than esterification.

Summary

Biosynthesis of cholesterol has been studied in a male patient suffering from essential hypercholesterolaemia. ^{14}C-labelled acetate was administered orally and the radioactivity in the free and ester fractions of the plasma cholesterol was estimated at intervals for 144 hours. The specific activity of the free cholesterol reached a maximum within four hours, fell relatively rapidly between 4 and 24 hours, and then more slowly until the end of the experiment. The declining specific activity of the free cholesterol could be described by three exponential components, the significance of which is discussed. The specific activity of the ester fraction increased slowly, and became equal to that of the free cholesterol at about two and a half days and reached a maximum at about four days. The results have been interpreted as showing an increased rate of biosynthesis of cholesterol from acetate in this patient.

We thank the Joint Research Committee of King's College Hospital and Medical School for grants towards the cost of isotopes and the special equipment used, and Dr. Wilfred Oakley for his kindness in placing a bed at our disposal for the investigation to be carried out. We are grateful to Dr. G. J. Popják and to Dr. J. V. Scott for their helpful discussions and criticism.

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"It is true that the temperature of fish reaching fishmongers has already risen as a result of inadequate icing all along the line. Nevertheless, the figures indicate that temperatures rise much more rapidly in the fishmongers' premises than elsewhere during distribution. There can be no alternative to the much greater and more widespread use of crushed ice by the fishmonger. In brief, it can only be concluded from this survey that insufficient ice is used throughout the entire distribution in summer, with the result that fish temperatures during distribution are considerably higher than they should be. Consequently, the bulk of British fish is spoiling several times as fast as it would do if enough ice was used in packing it during distribution and sale to keep its temperature close to 32° F." (*The Temperature of British Fish during Distribution in Summer*, Torry Technical Paper No. 1, H.M.S.O. (Edin.), 3s. 6d. net.)

RESULTS OF TREATMENT OF PNEUMOCONIOSIS COMPLICATED BY TUBERCULOSIS

BY

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Most patients who suffer from infectious pneumoconiotuberculosis die within a few years. Antituberculous chemotherapy has been found to be singularly ineffective in these patients. Most of the published studies have described little more than a palliative effect. This is in striking contrast to the almost invariable success with which patients with uncomplicated pulmonary tuberculosis can be treated. We report here on our experience, which suggests, contrary to other writers, that similar success can be obtained in patients suffering from advanced pneumoconiosis in addition to tuberculosis.

The Patients

Selection of Cases.—There were in all 29 cases of pneumoconiosis complicated by tuberculosis treated in Bangour Hospital, West Lothian; Southfield Hospital, and the City Hospital, Edinburgh, between 1953 and 1958. Of these, one was excluded because he had left the district and could not be traced. Three others were also excluded because they had only recently come under observation. Otherwise there have been no exclusions. There remained, therefore, 25 patients for analysis.

Diagnosis.—Of these 25 patients, 17 were coal-miners with anthracotuberculosis, and the remaining eight suffered from silicotuberculosis. Tubercle bacilli were cultured from sputum in each case, and in most cases were found on direct smear as well. Twenty-four of the patients had been awarded pensions by the Pneumoconiosis Medical Panel of the Ministry of Pensions and National Insurance. The remaining patient had not applied for a pension.

Age.—The patients' ages ranged from 44 to 79 years, the average being 59.3 years.

Duration of Exposure to Dust.—This ranged from 16 to 63 years (average 35.9 years). Exposure was longer in coal-miners (average 41.1 years) than in workers exposed to siliceous dust (average 25.0 years).

Radiological Appearance on Diagnosis.—Eighteen cases were classified as breaking-down progressive massive fibrosis, while the remaining seven were classified as unmodified tuberculosis on a background of simple pneumoconiosis. The differentiation between these two groups was not easy except in those cases where *x*-ray films were available before the development of tuberculosis. Otherwise weight was given to the density of the pulmonary opacities, the presence or absence of distortion of the pulmonary architecture by fibrosis, the occurrence of inky-black sputum, and the radiological response to treatment. The categories of pneumoconiosis (Fletcher, 1955) were:

Simple		7
Progressive massive fibrosis. Category	A ...	2
" " " "	B ...	4
" " " "	C ...	3
" " " "	D ...	9

Categories A to D indicate increasing degrees of severity. Most cases therefore had very extensive disease.

Sensitivity of M. tuberculosis.—In every case sensitivity of the patient's organisms was determined towards *para*-aminosalicylic acid (P.A.S.), streptomycin, and isoniazid at the beginning of treatment. One case showed initial resistance to streptomycin (ratio>16). All the other cases showed sensitivity to the three drugs —that is, sensitivity ratios of up to and including two for streptomycin, up to four for P.A.S., and for isoniazid a growth of less than 20 colonies in a concentration of 0.2 μg. of isoniazid per ml.

Treatment

All patients were treated in hospital for a period of from one to 12 months, the average stay being eight months.

Chemotherapy.—All patients received chemotherapy. Only one had previously had drug treatment. Twenty were treated initially with streptomycin, P.A.S., and isoniazid combined, for an average period of 6.5 months. Streptomycin 1 g. was given daily in 12 cases, thrice weekly in seven, and twice weekly in one. Of the remaining five patients, two had streptomycin and isoniazid daily, one had streptomycin and P.A.S. daily, one had streptomycin thrice weekly with daily P.A.S., and one had P.A.S. and isoniazid daily. P.A.S. was given in a dose of 5 g. two to four times a day. The sodium salt was used except in two patients who showed gastro-intestinal intolerance and who were given calcium B-P.A.S. Isoniazid was also given daily in two doses of 100 to 200 mg. After discharge, P.A.S. and isoniazid were given in a cachet combining both drugs, to a total of 5 g. of P.A.S. and 100 mg. of isoniazid twice daily. At the time of reporting, 13 patients had completed treatment with chemotherapy. In these cases the minimum period of treatment was nine months, and the maximum 49 months (average 25.2 months).

Ferric Chloride Test for P.A.S. in Urine.—This test (Simpson, 1956) was performed in 17 patients for whom P.A.S. and isoniazid had been prescribed as out-patients. It was positive in 38 out of 47 tests (80.9%).

Surgical Treatment.—In one patient the right apico-posterior segment was resected. The sputum had converted to culture-negative before operation, but after eight months of treatment there was still some caseation in the specimen.

Results

Sputum conversion occurred in every case, consistently negative cultures being obtained. The time taken for this to happen varied from one to eight months, the average being 3.1 months (see Table). In only two cases were positive cultures subsequently obtained from patients showing sputum conversion. In one of these the patient left hospital against advice at the end of five months and thereafter did not take chemotherapy regularly. He has been readmitted recently, and the sensitivity tests show that his

Time Taken to Convert the Sputum to Culture Negative

Months of Treatment	1	2	3	4	5	6	7	8	
No. of patients converting ..	8	3*	5†	2	4	2	0	1	Total 25

* One patient refused further treatment after five months and relapsed.
† A positive culture was again obtained in one patient at the eighth month but none has been found since (see text).

organisms are still fully sensitive to P.A.S. and isoniazid, with which drugs he is again being treated. His organisms were primarily resistant to streptomycin. The other, who had urogenital tuberculosis in addition to advanced silicotuberculosis, had initially been treated with streptomycin 1 g. thrice weekly, P.A.S. 5 g. twice daily, and isoniazid 100 mg. twice daily. Unfortunately streptomycin had to be discontinued after five months because of toxicity. While still in hospital this patient relapsed at the eighth month, when tubercle bacilli were again cultured from the sputum and urine, and cold abscesses appeared in the chest wall and scrotum. His sputum again became negative when viomycin 2 g. twice weekly and oxytetracycline 4 g. daily were added to P.A.S. and isoniazid, it being feared that resistance had emerged. The organisms were found to be fully sensitive, however, and his sputum has subsequently remained negative for eight months. The explanation of this relapse may be that P.A.S. and isoniazid alone were insufficient to suppress the exceptionally large bacterial population present in this case.

Including the second case described above, there are 20 patients whose sputum is consistently negative on culture; the period of negativity ranges from 5 to 48 months (average 22.5 months). Four of the remaining five patients have died from other causes, though their sputum had become persistently negative, and the first patient described above has not yet converted. Thirteen patients who have completed chemotherapy have all remained culture-negative for a period ranging from 1 to 37 months (average 8.9 months) since stopping chemotherapy.

Radiological Change.—In six cases there was no radiological change; 10 showed slight improvement, and eight moderate improvement. In the case of the uncooperative patient there was deterioration. In 19 cases there were cavities on diagnosis, and these closed in four. The remaining 15 still have cavities. The seven cases of tuberculosis complicating simple pneumoconiosis appeared to fare better radiologically as six out of seven showed improvement, while in the group with progressive massive fibrosis 12 out of 18 showed improvement. Three out of the four instances of cavity closure occurred in the former group.

Deaths.—Four patients died, 37 months, 15 months, 14 months, and 7 months from the start of treatment. The respective causes of death were gastric carcinoma, cor pulmonale, non-tuberculous bronchopneumonia, and bronchial carcinoma. Post-mortem examinations were performed on the three patients who died at 37, 14, and 7 months, and there was no residual pathological evidence of active pulmonary tuberculosis in any of them.

Effects of Treatment on Working Capacity.—Only eight patients were working at the time of diagnosis. One was engaged in heavy industry, two were doing medium work, and five were doing light work. At the time of reporting, 10 patients had become fit for work following treatment, this being light work in all cases.

Discussion

So far as sputum conversion is concerned, our results are identical to those which can be obtained with uncomplicated tuberculosis (Ross *et al.*, 1958). All 25 patients have ultimately converted except for one patient who refused treatment after five months and subsequently relapsed; he is again under treatment. These results are more encouraging than those of other authors.

Early chemotherapeutic regimes often gave rise to drug resistance, with consequent failure or relapse. These dangers may be particularly great in pneumoconiotuberculosis, where the bacterial population is large and relatively inaccessible because of the avascularity of the lesions. It is not surprising that many authors reported little more than temporary symptomatic improvement, without sputum conversion or prolongation of survival (Boselli and Lusardi, 1950; Lang, 1951; Van Mechelen, 1951; Stojadinović and Stojadinović, 1952; Theodos and Gordon, 1952; Cox, 1953; Cohen and Glinsky, 1953). The best results were those of Moyer (1952), who obtained sputum conversion in 5 out of 13 patients with streptomycin alone or combined with P.A.S.

It is disturbing that later authors, even the most recent, have been unable to obtain substantially better results. Kilpatrick *et al.* (1954) found that only three out of 26 of their patients survived more than two years from the beginning of treatment; while Carpenter and Cochrane (1956), working in the same unit, could convert the sputum of only 1 out of 12 patients. Cogo and Casati's (1954) results were similar in their 15 cases. Only 7 out of 45 patients treated by Worth and Heinz (1956) remained permanently negative. Eight out of 10 patients of Courtois *et al.* (1956) converted, but six relapsed soon after treatment was stopped and further treatment gave little benefit.

Soloveva (1957) and Evers (1957) obtained good results only in the early stages of the disease, but even so a large proportion relapsed. Planques and Bollinelli (1957) had similar experiences, but Amsler (1957) was more optimistic, though he did not give any details. Even with various resection procedures in addition, Andrews *et al.* (1958) converted the sputum of only 3 out of 13 patients. Sadler (1958) obtained permanent conversion in each of five patients who had simple pneumoconiosis with superimposed tuberculosis; in contrast, only 2 out of 17 patients with progressive massive fibrosis and a positive sputum were converted. Morrow and Kantor (1958) found that in only 6 out of 22 patients did the sputum become permanently negative.

We consider that the reason for the failure that has been so widely reported in pneumoconiotuberculosis has been the incorrect use of chemotherapy. Most of Morrow and Kantor's (1958) patients received streptomycin 1 g. only twice weekly, with isoniazid 300 mg. daily, usually for at least nine months. Three of Sadler's (1958) patients had the acceptable combination of daily streptomycin, isoniazid, and P.A.S. for at least the first few months, while one had the same drugs three times weekly. The remainder of his patients received undefined "various standard courses" of these three drugs for at least nine months. Courtois *et al.* (1956) gave streptomycin as either 1 g. daily or 2 g. twice weekly, with daily isoniazid and P.A.S. for six months. Those patients who relapsed were re-treated without success and often with the emergence of isoniazid-resistance. Soloveva (1957) found that drug-resistance was difficult to prevent. Details given by all the other more recent authors mentioned above are too scanty to allow analysis.

There are clear causes of failure in the forms of treatment detailed above. Pre-treatment sensitivity tests were not described in any of these papers, nor was it usually stated whether previous chemotherapy had been given or not. There may have been initial resistance in some cases, and consequently resistance to the

remaining drugs of the combination might sometimes have emerged. Morrow and Kantor's combination of streptomycin twice weekly with isoniazid daily is notoriously apt to allow resistance to emerge (Medical Research Council, 1953), particularly when extensive disease is present. Though re-treatment failed in the patients of Courtois *et al.*, resistance sometimes emerged to isoniazid and not to streptomycin or to P.A.S., although all three were being given together. If the accuracy of the sensitivity results is accepted, it is difficult to explain this except as a result of the patients' failure to take P.A.S. (Simpson, 1956). The isoniazid might then be unprotected, if the streptomycin of the combination is being given only twice weekly. Even when there is full sensitivity and good combinations are given, there is a risk of relapse if chemotherapy is given for less than a year, particularly in far-advanced disease (Ross *et al.*, 1958). That this is also the case with pneumoconiotuberculosis is obvious from the results already quoted. These various problems have been discussed in detail elsewhere so far as they concern uncomplicated pulmonary tuberculosis (Ross *et al.*, 1958; Crofton, 1958).

It has been widely agreed that chemotherapy brings no radiographic change in these cases, even when the sputum is converted. Some definite though slight resolution was seen in more than half of our cases. In only one of these with progressive massive fibrosis was there cavity closure, though this did not affect sputum conversion in the remainder.

Unfortunately antituberculous chemotherapy cannot remove the dangers of non-tuberculous pulmonary infection and cor pulmonale which are present in patients with progressive massive fibrosis. Of our patients one died from each of these causes. Progressive massive fibrosis does not necessarily greatly reduce the expectation of life (Carpenter and Cochrane, 1956), and our patients should not fare worse than those who have never had tuberculosis. Though all our patients felt better after treatment, there was little change in their exercise tolerance and capacity for work.

A third of our patients have not yet finished treatment and only a half have been observed for a few months or more since stopping treatment. Nevertheless, though our results cannot yet be final, sputum conversion has conformed so closely to that seen in uncomplicated pulmonary tuberculosis (Crofton, 1958) that relapse in the future seems very unlikely. Many of our cases have already exceeded the two years within which 88% of the patients of Kilpatrick *et al.* (1954) died. Further, in three patients who died from other causes, post-mortem examination did not show any residual foci of active tuberculosis.

Methods of Treatment

We believe that the normal principles of antituberculous chemotherapy apply in the same way whether pneumoconiosis is present or not. Initial sensitivity tests and the previous chemotherapeutic history must guide treatment. Initially we give streptomycin 1 g. daily with P.A.S. 15 to 20 g. and isoniazid 200 mg. daily, and always in hospital. When full sensitivity of the organisms is proved the streptomycin can be reduced to 1 g. thrice weekly. Though almost all of the patients will be in the age groups where vestibular toxicity is likely, 15 of our patients did receive daily streptomycin for an average of five months wthout such toxicity, except in one case. Once the sputum has become persistently negative on culture, discharge from hospital is considered; and after discharge treatment as out-patient is continued. Combined cachets are prescribed, of P.A.S. to a total of 5 g. twice daily and isoniazid to a total of 100 mg. twice daily. These reduce but do not eliminate the danger of the patient taking an inadequate dose, with subsequent resistance. We test the patient's urine occasionally for P.A.S. to make sure he is taking the cachets. Although we gave calcium B-PAS to two patients, we would now use only preparations which give adequate levels of P.A.S. in the blood. As there are usually open cavities left in these patients, we give a minimum of two years of continuous chemotherapy.

When resistance to two or more standard drugs is present, less reliable chemotherapy has to be used and surgery should be considered. Otherwise surgery has little place in the treatment of the patients.

Summary and Conclusions

Antituberculous chemotherapy has hitherto been regarded as having little permanent effect in advanced pneumoconiosis complicated by open tuberculosis.

Our experience has been more encouraging, and we have found that these patients can be treated as successfully as those with uncomplicated pulmonary tuberculosis. Sputum conversion to negative should approximate 100%, though no great radiological change can be expected.

All cases of pneumoconiotuberculosis that were admitted into three Scottish hospitals from 1953 to 1958 have been analysed. There were 25 patients, 18 of whom had progressive massive fibrosis. In all, except one who defaulted and another who relapsed temporarily, the sputum has become consistently negative. Twenty were treated initially with daily or intermittent streptomycin together with daily P.A.S. and isoniazid. The remainder received combinations of two drugs. After conversion, out-patient treatment with P.A.S. and isoniazid was given. The mean duration of chemotherapy has been 25 months. Though eight patients are still continuing chemotherapy, in half this has been completed, and during a mean period of 8.9 months afterwards none has relapsed. Four have died from non-tuberculous causes.

There has been slight radiographic resolution in more than half of the patients, but cavity closure was obtained in only one of those with progressive massive fibrosis.

We are grateful to Dr. G. J. Summers, Dr. C. Kelman Robertson, Dr. I. W. B. Grant, Dr. N. W. Horne, and Professor J. W. Crofton, for allowing us to study cases under their care, and for criticism.

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PERSISTENCE OF HAEMOGLOBIN "BART'S" BEYOND INFANCY IN A CHILD WITH THALASSAEMIA

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Haemoglobin "Bart's" (Ager and Lehmann, 1958) was found in a newborn infant of mixed ancestry (Spanish, West-Indian, Negro, Chinese). Its electrophoretic mobility at alkaline *p*H was slower than that of haemoglobin H and faster than that of haemoglobin J, resembling that of haemoglobin N. On chromatography at *p*H 6 it moved faster than any hitherto known variant. This pigment was adjudged to be an abnormal foetal haemoglobin because of its absence in both parents, because its resistance to alkali denaturation was intermediate between that of haemoglobin A and haemoglobin F, and because its ultra-violet spectrum was of the foetal type. Haemoglobin "Bart's" was seen to disappear as the child grew older, and at the age of 6 months it had disappeared completely.

The possibility was considered that a haemoglobin discovered in early infancy in a Greek child (Fessas and Papaspyrou, 1957) was identical with "Bart's." This pigment migrated more slowly than J on paper electrophoresis at alkaline *p*H, and was not alkali-resistant. These two findings might have been due to the fact that the haemoglobins of Fessas and Papaspyrou had been in about half the concentration of that of the "Bart's" component. However, dilution of a haemoglobin containing 24% "Bart's" and a mixture of foetal and adult haemoglobin, with an equal amount of haemoglobin A, did not alter the mobility of the fast component. Samples of infants' blood containing haemoglobin "Bart's" and sent to us by Dr. F. Vella from Singapore, Dr. S. Tuchinda from Thailand, and Dr. R. Schneider from Galveston, Texas, contained amounts of "Bart's" varying from $< 10\%$ to $> 20\%$. The mobility on paper electrophoresis at alkaline *p*H was in all cases greater than that of J, and the isolated fraction was denatured more slowly than haemoglobin A and faster than haemoglobin F.

By the courtesy of Dr. F. Vella we have recently examined a haemoglobin from an infant suffering from anaemia. There was 15% of a "fast-moving" haemoglobin whose ultra-violet spectrum was of the foetal type. This haemoglobin moved on paper and starch electrophoresis at alkaline *p*H similar to J and more slowly than "Bart's." It may well be possible that we were here dealing with an abnormally large proportion of the pigment described by Fessas and Papaspyrou (1957). The haemoglobin sample was in the carboxy form and could therefore not be tested for resistance to alkali denaturation. Some of the fast-moving fraction was eluted from filter paper after electrophoresis, oxygenated for two hours, treated with sodium metabisulphite, and again briefly reoxygenated. This sample showed then an increased resistance to alkali denaturation, which had not been noted in their foetal variant by Fessas and Papaspyrou. However, we do not think that too much reliance can be placed on a result under these circumstances.

The present communication is intended to report yet another resemblance between haemoglobin "Bart's" and haemoglobin F—its persistence beyond the age of infancy in a child with thalassaemia. The patient, a boy aged 9 years, showed some degree of infantilism

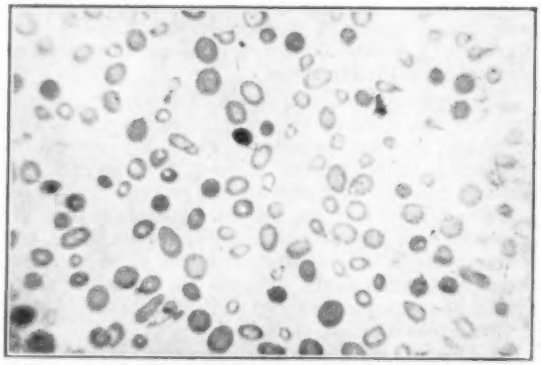

FIG. 1.—Stained film of the patient's blood. Moderate hypochromia, aniso-poikilocytosis, some macrocytes, and a few target cells are present.

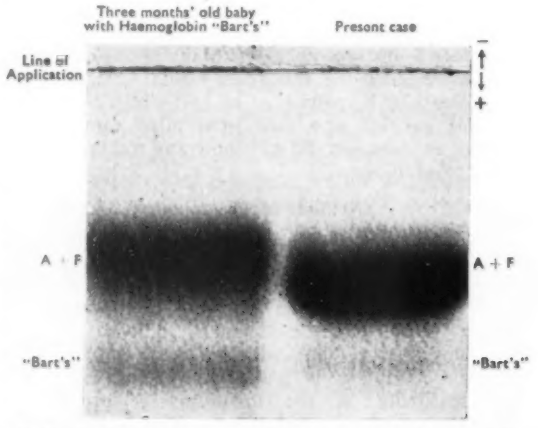

FIG. 2.—Hanging strip paper electrophoresis at *p*H 8.6, comparing the patient's haemoglobin with haemoglobin from the original infant with haemoglobin "Bart's," then aged 3 months, and showing 15% of the abnormal foetal pigment. The difference in the position between the two slow-moving fractions (A+F) is due to the higher haemoglobin F content in the baby's blood.

(height 118 cm., instead of 130 cm.; weight 20 kg. instead of 28–30 kg.). The facies was of the type seen in Cooley's anaemia and in microdrepanocytic disease. Haemoglobin concentration was 6.7 g./100 ml.; red cells 2,500,000/c.mm.; packed cell volume 22%; indirect serum bilirubin 0.75 mg./100 ml.; reticulocytes 2%. No inclusion bodies were formed on incubation of the red cells with cresyl violet. The red cells showed aniso-poikilocytosis and hypochromia and macrocytes (Fig. 1). The spleen was 3 cm. palpable; the liver was just palpable. *X*-ray examination of the skull showed widening of the diploic space, absence of the outer plate, and diffuse osteoporosis without, however, "brush appearance." The long bones showed no abnormality.

When the haemoglobin was examined a fast-moving fraction was seen on paper electrophoresis at *p*H 8.6 which moved more slowly than H and faster than J (Fig. 2). On elution from paper it was found to have an ultra-violet spectrum of the foetal haemoglobin type (Fig. 3). The same fraction separated from A and F on paper electrophoresis at *p*H 6.5, on starch electrophoresis at *p*H 6, and on "amberlite" chromatography at *p*H 6 (Fig. 4). In all these procedures a direct comparison with the original "Bart's" haemoglobin showed them to behave identically. Of the total haemoglobin, 10% was found to be alkali-resistant in the denaturation test of Singer, Chernoff, and Singer (1951). The total amount of foetal haemoglobins was, however, higher, and, combining the observations made on chromatography and electrophoresis, it could be calculated to be 13%, of which 7% was haemoglobin F and 6% haemoglobin "Bart's."

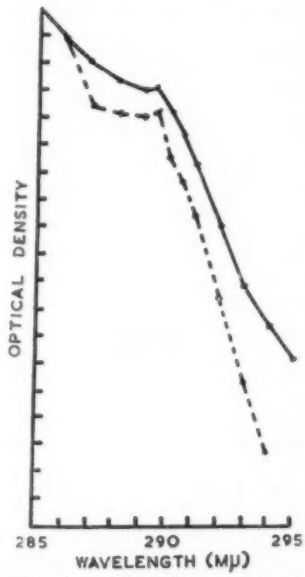

FIG. 3. — Ultra-violet spectrum. ●——●: Pure haemoglobin F eluted from amberlite chromatography column at *p*H 6. ●- - - -●: "Fast-moving" component of patient's haemoglobin eluted from starch after electrophoresis at *p*H 8.6.

Both parents showed evidence of thalassaemia in their blood. The father's blood could be examined fully. From the mother only one specimen of citrated blood could be obtained, but a satisfactory dry film could not be prepared. The father's film showed a mild hypochromia and numerous target cells (Fig. 5). No alkali-resistant haemoglobin was found in either parent and no haemoglobin "Bart's" was discovered on electrophoresis. However, the haemoglobin A_2 fraction was >3% in both (3.8 and 4.2% respectively). A failure of foetal haemoglobin to persist into adult life is not unusual in thalassaemia heterozygotes.

It seems, therefore, that the patient is suffering from thalassaemia major, and that in his case both haemoglobin F and "Bart's" have persisted beyond the age of infancy.

A haemoglobinopathy with which this condition might be confused is haemoglobin H disease. The blood picture is similar; and as in haemoglobin H disease, so here, a "fast-moving" haemoglobin is found in the patient but not in either of the parents, and there is evidence that the patient could have inherited thalassaemia.

The failure of the red cells to form inclusion bodies in cresyl violet solution in the cold; the resistance of the haemoglobin to cold denaturation; and, of course, the comparison of the fast fraction with haemoglobin H, will serve to distinguish the two conditions.

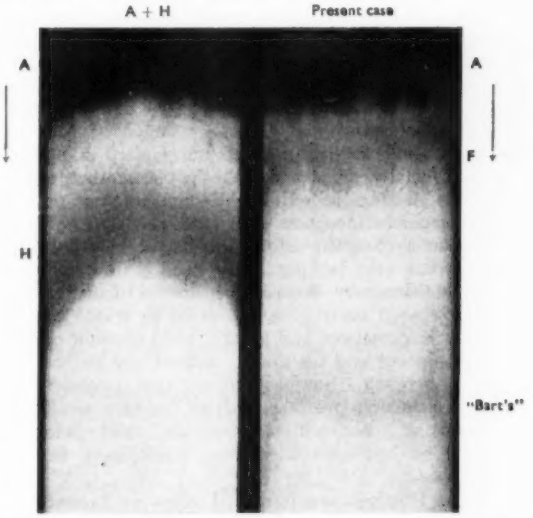

FIG. 4.—Amberlite resin chromatography at *p*H 6, comparing the patient's haemoglobin with one consisting of haemoglobins A and H. Haemoglobin "Bart's" is seen to move faster than haemoglobin H in this separation.

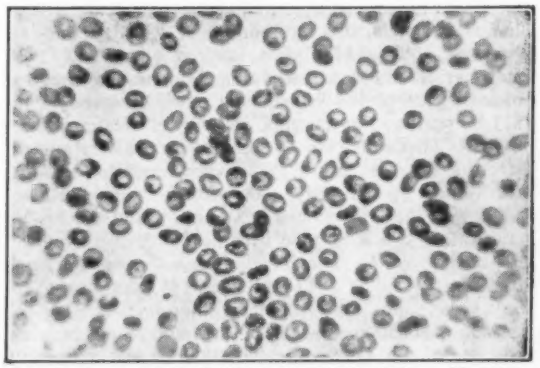

FIG. 5.—Stained film of blood of patient's father. Numerous target cells can be seen.

Summary

In a 9-year-old child with thalassaemia haemoglobins A and F and also haemoglobin "Bart's" were found. Hitherto "Bart's" has been demonstrated only in early infancy, and its persistence into a later age in conjunction with thalassaemia is further evidence in favour of its being a variant of foetal haemoglobin.

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Reviews

THE FOUNDER OF THE B.M.A.

The Life and Times of Sir Charles Hastings: Founder of the British Medical Association. By William H. McMenemey, M.A., D.M., F.R.C.P., D.P.M. (Pp. 516+xii; illustrated. 50s.) Edinburgh and London: E. and S. Livingstone Ltd. 1959.

Sir Charles Hastings is a name to be held in reverence by every member of the British medical profession. Not only was he the founder of the British Medical Association, but his persevering work over a period of 25 years in the face of much difficulty and disappointment largely contributed to the passing of the Medical Act of 1858. This Act established as the chief agent of much-needed reform the General Council of Medical Education and Registration of the United Kingdom known officially since 1951 as the General Medical Council. Hastings served as a Crown nominee on the Council from its inception until 1863.

Hitherto a complete and authoritative biography of Hastings has been lacking. This need is now supplied by Dr. McMenemey, a medical historian of distinction, who has spared no trouble and pains to search out all available information, and gives a vivid account of this medical pioneer and his times. Indeed, the author has gleaned so much from past history that, occasionally, he must have felt overwhelmed by the very wealth of his material. But with literary skill and judicious criticism he has unravelled what must have been a tangled skein.

Charles Hastings was born at Ludlow on January 11, 1794, the sixth son of the Rev. James Hastings, rector of Martley, Worcestershire. Warren Hastings was of the same family. In 1806 Charles's father was thrown from his horse and thereafter suffered from traumatic dementia. In this sad state he lived to be a centenarian. Charles was educated at schools at Martley and at Worcester. In 1812 after apprenticeship to two apothecaries and some study in London, he became house-surgeon to the Worcester County Infirmary. In 1815 he went to Edinburgh University graduating M.D. in 1818. Returning to Worcester he was appointed physician to the Infirmary and became the leading practitioner in that city. In 1832 he succeeded in founding the Provincial Medical and Surgical Association, which in 1856 became the British Medical Association. *The Provincial Medical and Surgical Journal*, founded in 1840 and since 1843 the journal of the Association, was renamed the *British Medical Journal*. Hastings was secretary and the inspiring influence of the Association. In 1856 he was appointed permanent President of the Council and its treasurer. Hastings was interested in hygiene and supported the work of Sir John Simon and other public health reformers. For his many distinguished services he was knighted in 1850. His good looks, tact, integrity, and persuasive manners also helped him in his crusade for raising the standard, opportunities, and dignity of the medical profession. He married in 1825 the daughter of George Woodyatt, M.D., of Worcester, and had one son and two daughters. His books and many papers and addresses are recorded in the bibliography here. Full of years and honours, he died on July 30, 1866.

Such is the brief outline of a life which Dr. McMenemey has so fully and ably written. For background he gives an admirable picture of the times and of doctors like Conolly, Lankester, John Kidd, Regius Professor of Medicine at Oxford, Sir Charles Throckmorton, Bart, M.D., Rumsey, George Burrows, and many others who aided Hastings in his reforms. The book is profusely illustrated with portraits of Hastings and his friends and colleagues. The turbulent figure of Thomas Wakley, founder and editor of the *Lancet*, often critical of Hastings but also often helpful and appreciative, flits through these pages. Interesting, too, is the account of hydropathic treatment at Malvern in chapter 30, and it will be news to many that a College of General Practitioners was advocated by a body called the National Association of General Practitioners as far back as 1845. Dr. McMenemey is to be congratulated on a biography of permanent value.

ARTHUR S. MACNALTY.

TEXTBOOK OF SURGERY

Textbook of Surgery. Edited by Guy Blackburn, M.B.E., M.Chir., F.R.C.S., and Rex Lawrie, M.D., M.S., F.R.C.S., M.R.C.P. Foreword by Sir Russell Brock, M.S., F.R.C.S., F.A.C.S.(Hon.). (Pp. 1,122+xii; illustrated. 84s.) Oxford: Blackwell Scientific Publications. 1959.

The birth of a Guy's textbook of surgery must always be a notable nativity, and this textbook is no exception. The book is large and long, of course, as is inevitable in a surgical textbook to-day, but one must agree with Sir Russell Brock, who writes the foreword, that the material could not be more concisely presented. The whole field of surgery, with the exception of eye, ear, nose, and throat surgery and gynaecology, is covered by 16 members of the staff of Guy's Hospital, and the presentation is uniformly good; indeed, the editors must have exercised remarkable tact in attaining the uniformity which has been achieved. The presentation of the material is in many ways original and always attractive. Special attention has been paid to case-taking and record-making, and the value of this part of the editors' strategy is shown particularly in the section on head injuries and in the one on the breast. At the end of the text there are illustrations of about 80 surgical instruments, but some of these seem rather to lack point by not being mentioned in the text. The large, open type and generous spacing are partly responsible for the size of the book, but they will reduce for the student the strain of long sessions of reading.

This textbook is absolutely first-class and can be recommended almost without reservation to the undergraduate student. It contains just what he wants for the final examination, and its content, in fact, is just what a fledgling doctor requires, while remaining well within the intellectual capacity of the average final-year medical student. A great deal of space has been saved by the entire omission of all references. This lessens the value of the book to the postgraduate, but it is fairly clear that the editors and contributors have levelled their aim at an undergraduate clientele. Even so, it seems a pity that the writers of English textbooks should so often assume that the undergraduate student need not be taught the use of a medical library. The student will not miss these references, for he will not know the importance of references, but he may sometimes be disappointed in the index, which, if my mathematics are right, includes less than 3,000 items; this number might have been increased very substantially

by smaller and closer type. I did not count the illustrations, for they are numbered afresh in each chapter and there is no index list, but there seemed to me to be nearly as many illustrations as pages, and they are all of such good quality that they perhaps make up for the omission of references and the shortness of the index. At all events, the undergraduate student will unquestionably take this view. The rather sombre cover encloses paper of a very high quality, and the volume is a strong one which will stand up to hard wear.

IAN AIRD.

WORK OF CORONERS

Coroner's Practice. By Gavin Thurston, M.R.C.P.(Lond.), D.C.H. (Pp. 180; illustrated. 21s.) London: Butterworth and Co. (Publishers) Ltd. 1958.

The author in his preface to this book states that the idea is to give a simple outline of coroner's procedure in England and Wales, and this has been very ably carried out. The book will appeal to all who are interested in or concerned with the work of coroners, and for anyone wishing to take up a coroner's appointment a close study of this book will be of great assistance. Similarly, young doctors on the threshold of their career would do well to make themselves acquainted with the contents, in so far as the author describes in simple language the various problems that face a medical man from day to day. Unfortunately most newly qualified medical men suffer from an abysmal ignorance of the role of coroner and the relationship that should exist between that officer and the medical profession.

The position of county coroners vis-à-vis borough coroners is well set out; the latter usually work from one or two courts and have regular coroner's officers, while the former are served usually by the odd constable who happens to be on duty when a case is reported. This lays a great responsibility on the senior police officers as to the instruction of junior officers with regard to the appropriate procedure and the method of dealing tactfully with all relatives; here again the study of the subject-matter by senior police officers would be of interest and beneficial to them.

The fact that actual court procedure is concerned with only a small portion of the work of the coroners is emphasized, the greater part taking place under Section 21 of the Coroners' (Amendment) Act, 1926. For purely legally qualified coroners a close study of the common causes of "natural unexpected death" (chapter IV) must be invaluable, as would also be the discussion and classification of suicides and the causes thereof (Chapter VII). It is obvious that the author considers the verdict in suicide cases to be "Killed himself" and that the responsibility of indicating the state of mind of the deceased should not be laid upon the coroner. Unfortunately, it would appear that the Church of England clergy are prohibited from reading the full burial service over one who has died at his own hand unless the rider of "Balance of mind was disturbed" is added. Accidental death is discussed, the causes being classified, and the author offers advice on the conduct of the subsequent inquests.

This is an interesting survey of the work of coroners and a useful adjunct to that well-established textbook *Jervis on Coroners.*

A. C. SOMMERVILLE.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received.

The Functions of the Endocrine Glands. By Peter F. Hall, M.D., M.R.C.P., M.R.A.C.P. (Pp. 290+viii. 78s.) Sydney: Horwitz Publications Inc. London: Pitman Medical Publishing Co. Ltd. 1959.

How to Learn Medicine. By A. E. Clark-Kennedy, M.A., M.D., F.R.C.P. (Pp. 227. 12s. 6d.) London: Faber and Faber. 1959.

Die Helldunkeldeutungen im Psychodiagnostischen Experiment von Rorschach. By Professor Dr. Hans Binder. (Pp. 127. DM. 12.) Berne, Stuttgart: Verlag Hans Huber. 1959.

An Introduction to Medical Genetics. By J. A. Fraser Roberts, M.A., M.D., D.Sc., F.R.C.P. Second edition. (Pp. 263+x; illustrated. 35s.) London: Oxford University Press. 1959.

Doctors to the World. By Murray Morgan. (Pp. 208; illustrated. 21s.) London: Robert Hale. 1959.

The New Frontier. Man's Survival in the Sky. By K. G. Williams. (Pp. 161+vi; illustrated. 21s.) London: William Heinemann Medical Books Ltd. 1959.

Il Gargoilismo. Aspetti Clinico-Statistici e Rassegna di 172 Casi di cui Il Personali. By Giuseppi Falchi and Mario Midulla. (Pp. 349; illustrated. L. 3,500.) Rome: Il Pensiero Scientifico. 1958.

Physiology of Cardiac Surgery, Hypothermia, Extracorporeal Circulation and Extracorporeal Cooling. By Frank Gollan, M.D. (Pp. 96+x; illustrated. 34s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1959.

Allergic Encephalomyelitis. Proceedings of a Symposium: Experimental "Allergic" Encephalomyelitis and its Relation to Other Diseases of Man and Animals. Edited by Marian W. Kies, Ph.D., and Ellsworth C. Alvord, Jr., M.D. (Pp. 576+xiv; illustrated. £5 2s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1959.

Community Mental Health. By Margaret C.-L. Gildea, M.D. (Pp. 169+ix. 37s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1959.

X-Ray and Radium in Dermatology. By Bernard A. Wansker, M.D. (Pp. 114+xiv; illustrated. 37s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1959.

Die Sterilität der Frau. Ein Leitfaden der Diagnostik und Therapie für die Praxis. By Professor Dr. Werner Bickerbach and Dr. Gerd K. Döring. (Pp. 71+viii; illustrated. DM. 6.80.) Stuttgart: Georg Thieme Verlag. 1959.

Principles of Medicine for Nurses. By David Weitzman, M.D., M.R.C.P. (Pp. 237; illustrated. 21s.) London: Faber and Faber. 1959.

Differential Treatment and Prognosis in Schizophrenia. By Robert D. Wirt, Ph.D., and Werner Simon, M.D. (Pp. 198+xii. 50s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1959.

The Plasma Proteins. Clinical Significance. By Paul G. Weil, B.A., M.D., C.M., M.Sc., Ph.D. (Pp. 133+xvi. 28s.) Philadelphia, Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co. Ltd. 1959.

The Szondi Test in Diagnosis, Prognosis and Treatment. By Lipot Szondi, M.D., Ulrich Moser, Ph.D., and Marvin W. Webb, A.M., Ed.D. (Pp. 309+xv; illustrated. 96s.) Philadelphia, Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co. Ltd. 1959.

Insulin Treatment in Psychiatry. Proceedings of the International Conference on the Insulin Treatment in Psychiatry held at the New York Academy of Medicine, October 24 to 25, 1958. Edited by Max Rinkel, M.D., and Harold E. Himwich, M.D. (Pp. 386+xxix. 55.) New York Philosophical Library. 1959.

Hautveränderungen durch Äussere Einwirkung Allergische Krankheiten und Toxische Schädigungen der Haut. Formenkreis des Ekzems. (Pp. 695+xv; illustrated. DM. 132.) Stuttgart: Georg Thieme Verlag. 1959.

BRITISH MEDICAL JOURNAL
LONDON
SATURDAY SEPTEMBER 5 1959

MEDICAL EDUCATORS AT CHICAGO

If medicine is a lifelong study, what are the best ways of encouraging doctors to continue their medical education, how are specialists to be trained, and where are the teachers to come from? These and many other questions have been debated this week at Chicago, where the Second World Conference on Medical Education has been held under the sponsorship of the World Medical Association, with the collaboration of the World Health Organization, the Council for International Organizations of Medical Sciences, and the International Association of Universities. President Eisenhower is the patron of the conference, and Dr. Raymond B. Allen, Chancellor of the University of California at Los Angeles, its president.

Even without this impressive support the conference shows every promise of being a worthy successor to the First World Conference on Medical Education held in London six years ago. The *Proceedings*[1] of that conference have since become an indispensable record for those who wish to have before them the views of leading medical teachers all over the world on undergraduate medical education, and judging by the programme of the second conference its proceedings will form an equally valuable symposium on postgraduate education. Many of the subjects which will be discussed were suggested by a hard-working committee[2] of the B.M.A. under the chairmanship of the late Sir Lionel Whitby, the president of the first conference.

We publish in our opening pages the addresses given at the beginning of the conference. At the conclusion of these delegates dispersed among four sections: the first on "Basic Clinical Training for All Doctors"; the second "Advanced Education for General and Specialty Practice"; the third "The Development of Teachers and Investigators"; and the fourth, "Continuing Medical Education." Delegates from all over the world have been present, and about 125 speakers have been invited to contribute papers. In sponsoring this and the first conference the W.M.A. is giving medical educators from the participating countries an opportunity to learn from a vast international store of experience in traditional and experimental methods of teaching.

[1] *Proceedings of the First World Conference on Medical Education*, 1954. Oxford University Press.
[2] *Brit. med. J. Suppl.*, 1956, **1**, 190.

MEDICINE A LIFE OF STUDY

There must be, unfortunately, many medical graduates to whom the concept of medicine as a lifelong discipline makes little appeal—many for whom the day of graduation represents the end of long years of tiresome study and for whom a medical degree means not only an independent existence but the prelude to a more practical way of life, and, especially, to earning a living. Like Becky Sharp leaving Miss Pinkerton's academy after throwing Johnson's "Dixonary" at the feet of Miss Jemima, they lean back in their carriage in an easy frame of mind, saying, "So much for the Dixonary; and thank God, I'm out of Chiswick." It is well for those who think about postgraduate medical education to remember, as William Osler did in his valedictory address at McGill University in 1905, that not all doctors are students by nature and in perpetuity. These reluctant horses, if the metaphor is allowed, must be led to the water and there persuaded to drink. For the minority who, in their postgraduate life, are still thirsty for knowledge and greedy for education no inducements to study are required. Just as in undergraduate education enthusiasm in the teacher is more important than methods of pedagogy, so in postgraduate study what is essential is the passionate intention of the student to neglect no opportunity of education. Fortunately many of those who, like Becky, have thrown aside their textbooks soon find again the need to consult them.

The most important step in postgraduate education in Great Britain since the war has been the compulsory pre-registration year of hospital appointments. In this year the apprentice becomes a craftsman and many an acolyte acquires for the first time a sense of vocation which he never afterwards loses. Despite the busy days and nights student habits are often fortified and the clinical discussions in the mess and in the residents' rooms quickly mature these developing practitioners. It is at this time that, in the words of Dr. Raymond B. Allen in his Presidential Address to the Second World Conference on Medical Education, the doctor finds happiness in self-realization and "the individual comes to understand and realize himself—what he is and what he can do." Certainly if the doctor is to help sick people his education must have produced a man who is cognizant of the world he lives in and of his own place in it. In a final eloquent passage Dr. Allen describes one function of the physician—so to

humanize science that "he will cushion the hammer blows of cold science and technology and of powerful government." We may be sure that Dr. Allen does not mean by this that the job of the physician will be simply to hand out tranquillizers and euphoriants in the Brave New World.

The three papers on international co-operation in postgraduate education by Professor Sheth of Bombay, Professor Grzegorzewski of Puerto Rico, and Professor Monteiro of Singapore, clearly demonstrate that there are urgent tasks demanding increased international effort. Dr. Sheth's statement that in 1926 there were only ten medical schools in India, that to-day there are 50, and that by 1965 there will be 67, will astonish all but the knowledgeable. There is naturally an acute lack of teachers, of equipment, of technicians, and of workshops. Dr. Grzegorzewski discusses the important problem of the postgraduate student who returns to his native country having acquired methods, techniques, and ideas which are soon shown to be difficult to apply —and indeed are often unsuitable—in a different environment. Professor Ian Aird discovered that delegates from the First World Conference on Medical Education returning to their own countries were frustrated in their plans for reform by lack of funds. Both Dr. Sheth and Dr. Monteiro, while emphasizing the magnitude of the task still to be done, also tell of the help that has already been given by the great foundations, the universities, the international organizations, and the business corporations. The Colombo Plan has produced great results in South-east Asia; this is not paternalism but co-operation. The example of the Royal Australasian College of Surgeons, who regularly send eminent surgeons to teach and examine graduates in Singapore, might be much more widely followed by the United States, by Canada, and by Great Britain both in India and in South-east Asia. Another stimulating news item from Singapore is that the China Medical Board has given generous help in the development of a medical library and has also provided much-needed equipment and apparatus. What Dr. Allen calls the challenge of "rising expectations" is being finely answered.

Continuing attention was given at the Conference in Chicago to methods of teaching. Dr. Victor Johnson discusses the value of research as a component in the education of doctors. One of the basic differences in the education of medical students in the U.S.A. and in Great Britain and Canada is that more students in the United States have a period of research during their training. Money is found for this, and, instead of working in industry to earn something during his vacation, the student in many medical schools is paid by various departments 1,200 dollars for three months' laboratory investigation. The nearest approach to this educational scheme in Great Britain is the Honours Schools in Anatomy and Physiology, for which a small number of students can readily obtain a year's scholarship. Their numbers, however, are much less than the 20% of American medical students who may be given a chance of research during their training. It is hoped that some of the speakers at the Conference have provided a comparison of the value of the different systems of medical education already in being. How do the doctors who have done some student research compare with those who have not? How many maintain this research attitude later in practice? How do alien judges assess the value of the research done by students? Professor R. F. Farquharson discusses the undoubted value of research in the continuing education of the practising doctor. This type of group and individual research is attracting an increasing number of general practitioners in this country, and our own College of General Practitioners has been a notable pioneer in this field. The College knows very well how many doctors are providing opportunities of postgraduate study for family doctors, and these were reviewed in the 1958 Educational Number of this *Journal* (September 6). The College knows very well how many doctors are Becky Sharps who have to be coaxed back to the academy, how many have learnt self-help and self-discipline in the fashion of Samuel Smiles, and how many potential Pickles in general practice are adding to our corpus of medical knowledge.

In their contributions Professors Melville Arnott and Ian Aird look back at the first conference held in 1953. It was, as Dr. Louis H. Bauer says in the July issue of the *World Medical Journal*, "admittedly an experiment," and one which we think he is justified in describing as "an outstanding success." From the replies Aird received to his questionary, the conference and its *Proceedings* have made—and will continue to make—a weighty contribution to medical education. He writes, "It is quite clear that the published *Proceedings* of the First Conference were of very great value to those responsible for new medical schools that have been brought to birth in the last few years." This is borne out by two contributors to the current issue of *World Medical Journal*. Dr. Palau, of Colombia, tells us how, "stimulated by the First Conference on Medical Education," he and his compatriots have reorganized medical education in that country, and Professor V. R. Khanolkar observes that the *Proceedings* were of help to the Government of India in calling its own conference in 1955.

Certainly the World Medical Association may take pride in what it has achieved by holding these two conferences, whose impact on the life of doctors in many countries will be experienced for years to come. And the *Proceedings* of the second conference, when published, will, with that of the first, constitute a textbook of medical education that will not be quickly out of date.

PATHOLOGY'S EXPANDING BOUNDARIES

Pathology has always occupied an intermediate position in the curriculum of the medical student, following anatomy and physiology and preceding medicine and surgery. This is obviously its natural position, but in many medical schools there has been a tendency in recent years to begin the study of pathology earlier and to continue it later. If the study of pathology is extended in this way the main emphasis in the earlier part of the course will naturally be on general and experimental pathology, thereby laying a foundation for the subsequent study of the aetiology and pathogenesis of disease. When a proper grounding in basic pathological principles has been achieved the senior student will be better prepared for the study of special pathology as it is met with in the post-mortem room and at clinical conferences. Taught in this way pathology ceases to be an isolated discipline: it forms part of a continuous course which is closely integrated with microbiology, radiobiology, and immunology on the one hand and with clinical medicine and surgery on the other.

Such an extension of the period of pathological studies has become necessary also because pathology itself has expanded its boundaries. In the first two decades of this century nearly all pathologists were attached to universities and medical schools and engaged almost exclusively in teaching and research. Then, in the period between the first and second world wars, the conception of clinical pathology began to develop and both teaching and non-teaching hospitals saw the necessity of establishing departments of pathology so that pathological knowledge could be applied directly for the diagnosis and treatment of disease.

The second world war saw the development of the emergency pathological services resulting in a great increase in the number of pathologists engaged in routine hospital pathology, blood-transfusion work, public-health services, and various research activities. The coming of the National Health Service resulted in a still greater expansion of pathological services and the recognition of clinical or hospital pathology as an essential part of the health services of the country.

Those who are now beginning their medical studies are likely to witness still further developments in what may be called applied pathology. When clinical pathologists first began to emerge from the seclusion of university and research laboratories to take an active share in the management of the sick, their work at first was concerned almost exclusively with diagnosis. The clinician turned to the clinical pathologist for help in reaching a more accurate diagnosis by means of laboratory tests. Before long, however, as the result of advances particularly in biochemistry and haematology, clinical pathologists were asked to take a share in the actual control and treatment of some diseases, such as diabetes and pernicious anaemia, and pathological investigations became increasingly used in the pre- and post-operative care of surgical patients. This practical application of pathology as an aid to diagnosis and to medical treatment is destined to continue still further, but in addition pathology is likely in the near future to enter also into the field of preventive medicine, and this in the end may prove to be its most important sphere of action. Evidence for this is to be found in a report[1] recently issued by the World Health Organization, entitled "Preventive aspects in the teaching of Pathology," the object of which is to show what an increasing share applied pathology might have in the prevention of disease in the future. It is usually through the teacher of pathology, the report states, that the student first becomes aware of the great possibilities inherent in modern medical science for the reduction or elimination of many grave diseases. While the epidemiologist can point out the problems in preventive medicine, the pathologist can seek to throw light on them not only through his own researches but also through the guidance he is well placed to give to other investigators: "as an *entrepreneur* in the medical sciences his position is unrivalled."

[1] *Wld Hlth Org. techn. Rep. Ser.*, No. 175, 1959. Geneva.

BRITISH POSTGRADUATE MEDICAL FEDERATION

The British Postgraduate Medical Federation of the University of London was established by the senate of the university in 1945 and received its charter and became a school of the university in 1947. It developed from the British Postgraduate Medical School (now the Postgraduate Medical School of London), which was opened in 1935 in association with the Hammersmith Hospital, and which is now the Federation's largest institute. Since 1945 postgraduate schools, termed institutes, have either been formed *de novo* or developed from pre-existing foundations in association with specialist hospitals in London and with the Royal

College of Surgeons, and to-day the Federation comprises the central office at 18, Guilford Street, London, W.C.1, the Postgraduate Medical School of London, and fourteen other institutes.

The institutes and their associated hospitals or Royal College are those of Basic Medical Sciences (Royal College of Surgeons), Cancer Research (Royal Marsden Hospital), Cardiology (National Heart Hospital), Child Health (Hospital for Sick Children, Great Ormond Street), Dental Surgery (Eastman Dental Hospital), Dermatology (St. John's Hospital for Diseases of the Skin), Diseases of the Chest (Brompton and London Chest Hospitals), Laryngology and Otology (Royal National Throat, Nose, and Ear Hospital), Neurology (National Hospitals for Nervous Diseases), Obstetrics and Gynaecology (Chelsea, Queen Charlotte's, and Hammersmith Hospitals), Ophthalmology (Moorfields Eye Hospital), Orthopaedics (Royal National Orthopaedic Hospital), Psychiatry (Maudsley and Bethlem Royal Hospitals), and Urology (St. Paul's, St. Peter's, and St. Philip's Hospitals). The University of London now recognizes that the educational and research activities of each institute attain to the academic standards of the university, and for them all to have reached this status in so short a time is a great achievement.

Apart from research, which is a major activity of the institutes, they provide a wide variety of education, ranging from formal courses of instruction for graduates hoping to become specialists to conferences and symposia for experts, and they contribute also to courses for general practitioners. For appointments in the associated hospitals there is keen competition. The central office, which houses the director and his staff, is the administrative centre of the Federation, carrying out the function of postgraduate dean of medicine of the university. Here are organized the refresher courses for general practitioners in hospitals in and around London and the well-known lectures on the scientific basis of medicine and dentistry. An information bureau maintains a record of courses and postgraduate facilities in the United Kingdom. Through its contacts with postgraduate deans and universities throughout the country and with the Royal Colleges, the College of General Practitioners, and the Commonwealth and International Medical Advisory Bureaux of the B.M.A., the director and his staff assist graduates to arrange programmes of study and advise them how to obtain hospital posts.

Much of the work of the British Postgraduate Medical Federation is concerned with graduates from overseas, and during the year ended July 31, 1958, 1,871 of the 3,216 graduates who enrolled at the institutes were from abroad. Programmes are arranged for graduates selected by their governments to study in Britain under the Colombo Plan, for officers in the Overseas Medical Service, and for foreign graduates sent officially by governments or universities or who come in a private capacity. The central office of the Federation has close links also in Australia and New Zealand, South Africa, and Canada. Graduates from overseas should seek the advice and help of the Federation before coming to the United Kingdom, because if they arrive unheralded they may find that the course or hospital department which they want to attend is unable to accommodate them, though hospital appointments for specialist training cannot be obtained in advance of arrival.

ASME

The Association for the Study of Medical Education, founded last year through the initiative of the Royal College of Physicians of London,[1] now has over 60 corporate members and an individual membership of over 150. To support the initial administrative costs of establishing the association the Rockefeller Foundation has given a grant of £2,000 per annum for five years. One of the main purposes of the association is to exchange information about medical education. The proceedings of the first conference[2]—an "Experiment in Medical Education"—will soon be published, and there is to be a conference at the College on October 15 and 16 on "Methods of Learning and Techniques of Teaching." The association is also assisting the British Medical Students' Association in organizing a symposium on the pre-registration year. In addition, working parties on the teaching of psychiatry and on the structure and functions of teaching hospitals are being set up, and two research projects are being planned—one is a study of the impact of the medical school upon the personality and outlook of the student and the second is an inquiry into the processes of learning.

The association has also had the benevolent notion of giving teachers in medical schools time "to reflect on the problems of medical education," and with the help of the Commonwealth Fund of New York a limited number of travelling fellowships will enable some teachers to go abroad and survey particular facets of medical education or just to observe the educational scene. If medical schools wish particular members of their staffs to undertake such studies abroad the association will be pleased to consider proposals from them. This brief account of the activities of the Association for the Study of Medical Education shows how quickly it has got into its stride and how much it can usefully do in a field which has been for too long neglected.

MEDICAL TEACHERS NEEDED

"There are many schools but not enough teachers." This statement by Professor U. K. Sheth (p. 328) in the shortest possible number of words summarizes the medical plight of many countries besides his own native India. Many of those who listened to him this week in Chicago at the Second World Conference on Medical Education will be able to fill in the details. Many more favourably placed will no doubt be moved to speed up plans already in being for increasing all over the world the numbers of men and women skilled in the techniques of modern medicine and their application. Professor E. S. Monteiro (whose paper also appears in this week's *Journal*) gives an account of what international co-operation has done to promote postgraduate medical education in Malaya. He refers in

[1] *Brit. med. J.*, 1958, **1**, 1405.
[2] Ibid., 1958, **2**, 851.

particular to the help given by the Colonial Development and Welfare Fund of the United Kingdom, and of the Colombo Plan. In our correspondence columns Sir George McRobert tells us that the Commonwealth Relations Office often receives requests from South-east Asian countries for teachers in second M.B. subjects. The "loan" of professors, readers, or lecturers to these countries is made under the technical co-operation of the Colombo Plan. Help in the same subjects is also being sought by the College of Medicine of Bagdad University, which wants British candidates for the chairs of bacteriology, pathology, ophthalmology, pharmacology, obstetrics and gynaecology, and surgery. The British Council is responding to this request by seeking suitable occupants for these chairs, and it is hoped that those in charge of British medical schools may find it possible to second young medical teachers to assist a college which was founded with British help and conducted on British lines with English as the medium of instruction.

These are but one or two instances picked out at random to illustrate the desperate need there is in vast areas of the world for more and more medical men and women who can bring to huge populations yet uncared for the benefits of modern medicine. And it is heartening to know that the World Medical Association has managed in the short period of its existence to hold two important international conferences on medical education, because unless the foundations of this are firmly laid then no amount of equipment or technical aids is of much use.

TEACHING OF RADIATION MEDICINE

A recent report from the World Health Organization[1] presents the collective views of an international group of experts on the "Introduction of Radiation Medicine into the Undergraduate Medical Curriculum." Now that the era of atomic energy has dawned the importance of the subject is not in question. The difficulty is to "preserve the balance of an already weighty curriculum and to protect the students from demands that may prove detrimental to their intellectual development." It can be argued that much of the knowledge of atoms, isotopes, and ionizing radiations is as unnecessary to doctors as knowledge of the chemical structure and exact mode of action of many drugs: it is what morphine does when it is absorbed into the body that is important, and so long as we know this the drug may be used with safety.

Much of the student's education in radiation medicine can be fitted into the curriculum as a contribution towards a better understanding of normal physiological processes. For instance, the use of tracers in animal experiments will add to his knowledge of biochemistry and physiology; radio-autography enlarges the scope of histology; and radiological demonstrations can give life to the dry bones of anatomy and illustrate such mechanical processes as deglutition. The normal intravenous pyelogram and other contrast studies can be used in teaching before the student enters the wards. These examples could be multiplied, and their importance is to keep the student constantly aware of the uses and effects of ionizing radiations. As to pathology, the atomic age has already imposed additional burdens on this branch of medical science, for study of the changes in living tissue that follow irradiation demands new methods of investigation. A knowledge of radiation pathology is fundamental not only to the application of ionizing radiations to therapeutics but also to the protection of the health of the community of to-day and perhaps of generations yet unborn.

[1] *Wld Hlth Org. techn. Rep Ser.*, No. 155, "Introduction of Radiation Medicine into the Undergraduate Curriculum," 1958. Geneva.

ARMED FORCES MEDICAL SERVICES

The Fourth Report from the Select Committee on Estimates,[1] published as we go to press, recommends integration of the medical services of the armed Forces The committee believes that this would save money and manpower and increase efficiency. A joint service, it says, would have the advantages of greater size and scope and medical officers in it would gain wider clinical experience. To these advantages the committee adds those of greater flexibility in the deployment of specialists and of the need for a smaller administrative staff, which would reduce expenditure and release a number of senior medical officers for professional duties.

Integration of the medical services of the armed Forces has been considered off and on by committees and Service departments since 1946, and all have raised objections. The Forces Medical and Dental Committee (the Waverley Committee) thought amalgamation undesirable,[2] as also did the B.M.A. in its evidence to that committee, because of the specialized needs of each service, their differing tasks and functions, and hence their different organizations and the need to preserve the *esprit de corps* engendered by loyalty to an individual service. The Select Committee, however, thinks that the size and function of the services have now altered so much that the Waverley Committee's views are to some extent invalidated. The B.M.A. does not think so, and recently repeated its objections to integration in its evidence to the Select Committee, and the Service departments' attitude to it is described by the Select Committee itself as being "disappointingly inflexible."

The proposal will therefore provoke much discussion. There will be more general agreement, however, on a recommendation that until the long-term objective of integration can be achieved better co-operation between the medical services would be gained by the appointment of a new and enlarged co-ordinating committee of the kind suggested by the Waverley Committee. Other proposals, such as those for co-operation of the services with the National Health Service, will need examining.

[1] *Fourth Report from the Select Committee on Estimates, Medical Services of the Armed Forces, 1958-9*, 1959. H.M.S.O., London. Price 14s.
[2] *Brit. med. J. Suppl.*, 1956, **1**, 109.

British Medical Association

JOINT ANNUAL MEETING WITH THE CANADIAN MEDICAL ASSOCIATION, EDINBURGH, 1959

SUMMARY OF PROCEEDINGS

THE SECTIONS

SECTION OF MEDICINE

Monday, July 20

Health Education

Professor D. M. DUNLOP (Edinburgh), who presided at this session, remarked that it was not so very long ago that medicine was veiled in mystery and magic. Patients had always tried to make quacks of their doctors. Now that the art of medicine had been tinctured by a handsome dose of science, that extra obscurantism of the gold-headed cane was yielding. Surely it was wise that the public should be told about the rules of health—men, and particularly women, tended to dig their graves with their teeth—but the profession was still profoundly divided as to the education of the public in regard to disease.

Dr. C. M. FLETCHER (London) remarked that now that the powerful medium of television had been enlisted by the patent-medicine advertisers the same powerful medium must be enlisted to expound healthier concepts that those of the advertisers. It should be clearly recognized that preventive medicine—he preferred the term to "health education"—was concerned with the prevention of disease, injury, and pain, and not with instruction in a mystique called "positive health."

Reassurance by Television

The first advantage of broadcasts concerning the recognition, natural history, and treatment of disease was that explanation and demonstration of the vast therapeutic power of modern medicine might encourage people to seek medical help for early and easily curable disease. There was ample evidence that reassurance had been conferred by television programmes. The second advantage was their general educative value, presenting medicine as a human branch of science and dispelling the still widespread and complacent illusion—fostered by some doctors—that medicine was an esoteric mystery.

It must not be expected that all the effects of even the best type of broadcast would be favourable. An unemotional, and indeed a statistical, view must be taken. With sensible precautions all types of programmes should be tried and their effects assessed. But there should not be condemnation without evidence, or upon evidence from isolated cases.

Dr. RICHARD ASHER (London) said the public must be given some medical education because they demanded it. Doctors would be happier if they did not have it, but if doctors did not tell them they would invent explanations of their own. Indirectly, a little knowledge of medicine in the hands of patients might benefit doctors. Blind ignorant faith in doctors was not always to their benefit.

Magazine Medicine

Turning to the sources from which the public received their education, Dr. Asher listed schools (except when biology was taken there was little teaching of elementary physiology), medical encyclopaedias (did more harm than good), newspapers, wireless, and television. The medical correspondents of the better papers were very skilled, but he was uncertain that their writings were always understood aright. The danger of magazine medicine was that it selected the sensational and eschewed the humdrum. Dr. Asher thought the "questions" column satisfied the universal urge to appear in print. The medical benefit to readers was questionable. Nevertheless the pleasure they imparted to others was immense.

For education in the future Dr. Asher wanted less attention to the sensational and more to the practical side of medicine.

Dr. GEOFFREY O. BARBER (Essex) spoke as a general practitioner. When seeing a patient with students, did medical teachers put three questions: "Why is the patient here? How can we prevent his coming again? And can we see to it that his children never come here at all?"? Health education of the patient should help to answer those three questions, for the object of health education was to create in each individual a sense of responsibility for his own health. He believed the family doctor had to shoulder a great deal more responsibility for this side of medicine than he had up to now.

Dr. Barber stressed the need for the family doctor to co-operate with the health visitor. General practitioners should compare notes with health visitors, particularly about problem families. People were kept alive much longer: it was up to doctors to see that they were able to enjoy this life.

Wednesday, July 22

Contributions from Canada

With Professor J. R. LEMIEUX (Quebec) in the chair, the session was devoted to the presentation of short papers by Canadian speakers.

The Comatose Patient

Professor E. F. J. BROOKS (Toronto) discussed the common causes of coma which could be due to pathological conditions inside the skull, such as epilepsy, cerebral trauma, apoplexy, cerebral inflammations, and cerebral tumours. Alternatively, it could be caused by conditions outside the skull, either in the form of circulating toxins (diabetes, uraemia, hypoglycaemia, and cholaemia), or of extrinsic poisons — for example, morphine, barbiturates, bromides, carbon monoxide, and alcohol. Professor Brooks quoted illuminating examples from his experience.

Diagnosis of Phaeochromocytoma

Professor F. S. BRIEN (London, Ontario) described some of the pitfalls in making a diagnosis of phaeochromocytoma. In this disease the hypertension could be either paroxysmal or sustained. While special investigations were useful in diagnosis, they could not replace a complete clinical examination.

In screening procedures the provocative use of histamine could be hazardous, but the hypertensive attack could also be cut short by the timely administration of "regitine." False positive diagnostic tests with regitine could be found in uraemia, or if the patient had received sedative or hypotensive drugs.

Staphylococcal Pneumonia

Professor R. B. KERR (Vancouver) described a review of 193 cases of pneumonia at the Vancouver General Hospital: 10% of these had been due to staphylococcal infection. He divided his cases into a primary group, those in which the disease was superimposed on chronic respiratory illness, post-operative, and terminal. The mortality rate was particularly high in the second and third categories, and he had found that many patients were infected with staphylococci before entry to hospital. The disease could be mild or fulminating. Fever was usually remittent and resolved by lysis. Most patients were in the

older age groups, and the majority did not recover. The diagnosis could be confirmed bacteriologically.

Conventional treatment was supplemented by intensive antibiotic therapy, which depended on the sensitivity of the organism. In most cases chloramphenicol, erythromycin, and vancomycin gave good results. Steroids were often helpful in the form of 100–300 mg. of intravenous hydrocortisone daily. Staphylococcal antitoxin and gamma-globulin had sometimes been given. Tracheotomy might be needed if the sputum was thick and tenacious.

Cough Syncope Syndrome

Dr. R. M. MACDONALD (Halifax, Nova Scotia) said of the cough syncope syndrome that it was probably better known to patients than to their doctors. It had been described as long as 100 years ago and was known to Charcot as "laryngeal vertigo." In 1949 Baker had been able to collect 100 cases, describing nine of his own. The speaker considered that the syndrome was not uncommon and that family doctors would see most cases. He had been able to collect and study a series of 66 cases and had noted that the patient was usually an overweight male who smoked heavily and suffered from chronic bronchitis and emphysema. Only 30% of his patients were female. Nearly all cases showed some reduction of ventilatory capacity. The E.E.G. was normal—the disease had nothing to do with epilepsy. Other lesions which might be responsible for syncope in the individual case were rarely present, and during the period of loss of consciousness serious injuries rarely ensued. In treatment it was important to eliminate precipitating factors.

Syncope in Cardiovascular Disease

Dr. W. A. OILLE (Toronto) discussed the basis of unconsciousness in the syncope which sometimes occurred in cardiovascular disorders. He had been particularly interested in those rare patients in whom attacks of unconsciousness might be attributed to vagal hyperactivity, and described two patients in which this had occurred. The first patient was an elderly woman who for many years had sustained 10 to 20 syncopal attacks each week. She was aware of irregular heart action before loss of consciousness. Emotion and menstruation were predisposing factors, and syncope could be brought on by eating and coughing. E.C.G. showed A.V. nodal block, yet clinical examination was quite negative. Tests with neostigmine and atropine suggested left vagal overactivity, and after section of the nerve in the neck the attacks ceased and had now been absent for nine years.

Diagnosis of Hyperthyroidism

Dr. J. P. GEMMELL (Winnipeg) described the clinical manifestations and appropriate diagnostic tests in hyperthyroidism. He regarded the loss of weight which occurred in 90% of patients as important in making the diagnosis, particularly if a history of increased appetite could also be obtained. However, patients in the younger age groups often lost little or no weight. Older subjects suffering from the disease were frequently apathetic, depressed, and akinetic, and in them cardiac disease was often found. Any patient in whom heart disease was associated with the presence of a goitre should be suspected of having hyperthyroidism. Myopathy was seen most often in middle-aged men. The affected muscles were weak and wasted and the facial muscles were often lax and flaccid. A "frozen shoulder" was sometimes an associated symptom.

Special diagnostic tests would not be required in obvious clinical cases, except to assess progress. When the diagnosis was in doubt he recommended estimation of the 24-hour uptake of radio-iodine, protein-bound iodine, and B.M.R. If, after these tests had been done, doubt about the diagnosis remained, he had found the triiodothyronine suppression test to be useful in confirmation.

SECTIONS OF MEDICINE AND CARDIOLOGY

Thursday, July 23

Aetiology of Atherosclerosis

The chairman, Sir GEORGE PICKERING (London) pointed out that the word atherosclerosis was coined by Marchand in 1904 to describe non-inflammatory disease in all coats of all the different-sized arteries, whereas what was really under discussion in the present symposium was atheroma—that is, primarily intimal degeneration affecting the larger arteries, and associated thrombolic occlusion, especially of the coronary arteries.

Dr. JACQUES GENEST (Montreal) reviewed work done on the cause of atherosclerosis and stressed the concept that atherosclerosis and coronary thrombosis were two distinct and different phenomena. He mentioned the contribution that dietary, biochemical, and epidemiological studies had made in throwing light on some of the factors that seemed to play a part, but felt that caution was required in their interpretation.

Professor W. F. CONNELL (Ontario) cited experimental evidence to show that lowering of the blood-cholesterol level in patients receiving corn oil was not directly related to the degree of unsaturation of the fats, but was due to some other factor contained in the oil. The rise in blood cholesterol resulting from eating butter was shown to be due directly to its cholesterol content. He made a plea for a better balance in the use of animal and vegetable fats in cooking.

Epidemiological Surveys

Dr. J. N. MORRIS (London) quoted evidence to suggest that, while the incidence of coronary atheroma was decreasing, that of obstruction of the lumen with narrowing and frank thrombosis was on the increase. Two conditions shed further light on the separate trends of mural disease and luminal occlusion of the coronary arteries. While in hypertension mural disease was much increased, there was relatively little increase in luminal obstruction. Conversely in peptic ulcer, in which the incidence of luminal obstruction was greatly increased, mural disease was no more than that found in the general population. Similarly, in a study of patients with light or heavy occupations the amount of mural disease did not vary significantly in the two groups, whereas luminal occlusion was significantly commoner in those with lighter occupations. There appeared, therefore, to be two distinct processes, coronary atheroma and coronary thrombosis.

Hormonal Factors

Dr. M. F. OLIVER, (Edinburgh) suggested that the reason why, when we all eat more or less the same diet, we do not all develop coronary artery disease might be partly explained on endocrine factors. There was an association between hypercholesterolaemia and coronary artery disease and certain endocrine diseases. Diabetes, myxoedema, and bilateral ovariectomy were all accompanied by an increase in the blood-cholesterol level and increasing frequency of coronary artery disease. On the other hand, in thyrotoxicosis and castration the blood-cholesterol level was low and coronary artery disease rare. The preponderance of males among those with coronary thrombosis was well known. This sex preponderance was also age-dependent, the male: female preponderance being as high as 19:1 in patients under 35 years, and becoming progressively less marked with increasing age, until at the age of 70 the incidence was equal. In women a cyclical change in blood-cholesterol level could be measured, the level falling during ovulation, when oestrogen excretion in the urine was increased. After the menopause there was a rise in blood-cholesterol levels with an increase also in coronary artery disease, but no parallel rise in blood cholesterol occurred in men in a similar age group. Experimentally the administration of oestrogens was found to lower the circulating lipids, whereas giving androgens had the reverse effect.

Summing up, Sir GEORGE PICKERING said that, in addition to the chief facets discussed in the symposium, genetic constitution was a factor in aetiology, and that in this field the study of familial xanthomatosis had been important and helpful. He thought that exercise was perhaps just as important as diet in avoiding coronary occlusion.

SECTION OF MEDICINE

Friday, July 24

Abnormalities of Adrenocortical Secretion

Professor A. KEKWICK (London) was in the chair when Dr. J. D. N. NABARRO (London) read the opening paper at this discussion. He attributed Cushing's syndrome to an excess of circulating hydrocortisone which might be due to carcinoma, adenoma, or bilateral hyperplasia of the adrenal cortex. In the last instance overproduction of A.C.T.H. by the pituitary was usually responsible, and cortical hyperplasia was the most frequent cause of the syndrome. Excessive A.C.T.H. production was responsible for the skin pigmentation sometimes seen after bilateral adrenalectomy. Reviewing the signs and symptoms of Cushing's syndrome, Dr. Nabarro said that the appearance resembled that of patients who had been receiving large doses of cortisone for long periods, but minor differences did exist; for example, peptic ulcer did occur in Cushing's syndrome, but was rare. If the diagnosis was in doubt the most important laboratory investigation was measurement of the urinary 17-hydroxycorticosteroids with the Norymberski method. Other tests could give only indirect supporting evidence.

Treatment depended on the cause of the condition. A primary adrenocortical carcinoma was often operable, but relapse soon followed from functioning metastases. Removal of an adenoma resulted in permanent cure, but many months must elapse before the remaining adrenal resumed normal function. Adrenocortical hyperplasia was best treated by bilateral adrenalectomy under steroid cover, and thereafter permanent replacement therapy would be needed.

Congenital Abnormalities

Dr. E. F. SCOWEN (London) described congenital abnormalities of adrenal secretion arising as a developmental error in the third or fourth month of foetal life, affecting one child in 30,000, in which there was lack of endogenous hydrocortisone. Androgen overproduction was associated with bilateral adrenocortical hyperplasia. Manifestations might be seen at birth in the form of pseudohermaphroditism, or thereafter in childhood. A syndrome of acute salt loss with dehydration and collapse might be seen within the first two weeks of life, and was usually fatal if unrecognized. In boys there was rapid somatic growth, early development of secondary sex characteristics, and precocious puberty; although the penis was enlarged, the testes were often small, and histologically resembled adrenocortical tissue. Female children showed virilization and failure to reach puberty. Rapid initial somatic growth ended at about the age of 10, when the epiphyses fused, and there was final stunting. Early recognition of the disorder and adequate therapy would allow normal puberty to be attained. Substitution treatment with cortisone given indefinitely was indicated, and D.C.A. would be required at first, only to be gradually withdrawn later.

Adrenocortical Deficiency

Dr. A. G. MACGREGOR (Edinburgh) said that symptoms of adrenocortical deficiency, besides occurring in Addison's or Simmonds's disease, were also seen after therapeutic adrenalectomy or hypophysectomy, or, in certain circumstances, when patients received long-term steroid therapy. Modern treatment had greatly improved the prognosis of Addison's disease, and early diagnosis was thus of great importance. After bilateral adrenalectomy patients were liable to develop deficiency syndromes in the presence of infection or if operations were performed. Long-term steroid therapy caused inability to respond to increased adrenocortical demands, and deficiency symptoms could be avoided or treated by giving increased doses.

Aldosterone

Dr. J. C. BECK (Montreal) described the clinical and biochemical effects of altered aldosterone secretion. It was thought that a syndrome of hypoaldosteronism probably existed, but must be very rare. Physiological secondary hyperaldosteronism occurred when there was loss of salt and water, in haemorrhage, shock, and pregnancy, and after surgical operations. Pathologically, secondary aldosteronism was seen in nephrosis, congestive cardiac failure, cirrhosis, essential hypertension, and Cushing's syndrome. Primary hyperaldosteronism (Conn's syndrome) was associated with periodic muscular weakness, tetany, paraesthesiae, polyuria, and hypertension. Having described the biochemical findings Dr. Beck said that renal biopsy revealed a clear-cell nephropathy, and there might be evidence of pyelonephritis. It was more usual to encounter an advanced cortical adenoma than hyperplasia, and successful treatment effected a satisfactory remission unless renal damage was irreversible. The syndrome might exist in a mild form in which only hypokalaemia and alkalosis were manifest, and was of additional interest because it constituted one form of reversible hypertension. The speaker envisaged aldosterone in the future finding clinical use in the treatment of shock and post-operative collapse.

SECTION OF SURGERY

Monday, July 20

Malabsorption from the Small Intestine

With the joint president of the Section, Professor C. F. W. ILLINGWORTH (Glasgow) in the chair, Dr. W. I. CARD (Edinburgh) opened a symposium on diseases of the small intestine. He began by classifying the causes of malabsorption. First was the inadequate preparation of foodstuffs; deficiency of pancreatic juice and bile, and poor mixing of food with secretions, as after gastrectomy, could cause this. Second, diversion of nutriment to intestinal organisms might be of especial importance in the case of trace substances, for which not only bacteria but also worms might compete. Third, malabsorption might result from inadequate contact of food with the intestinal mucosa, as occurred after massive gut resection. Fourth, defects in the intestinal epithelium could cause malabsorption, as in Crohn's disease. Fifth, and last, insufficient flow of blood and lymph could be important, and this mechanism, though speculative, could be a contributive factor under conditions of gaseous distension or necrotizing enteritis.

The commonest symptom of malabsorption was diarrhoea, which might be intermittent, with the passage of bulky, offensive pale stools which floated on water. Loss of weight, anaemia, vitamin deficiency, neuropathy, and osteomalacia might also occur.

Professor A. W. KAY (Sheffield) confined his remarks to malabsorption complicating surgery. Gastrectomy could result in loss of "hopper" function, and then replacement with either jejunum or colon might help. The Polya operation did not produce "blind-loop" symptoms, as the loop was so quickly emptied by secretions, but after gastrectomy latent steatorrhoea might be activated and there was a temporary bacterial colonization of the jejunum. The *cul-de-sac* syndrome had two components, one mechanical, the other due to dysfunction and showing itself in malnutrition, steatorrhoea, macrocytic anaemia, and vitamin deficiency. The value of using antibiotics such as neomycin both diagnostically and preoperatively to suppress "consumer" bacteria was stressed.

Tumours of the Salivary Glands

Mr. T. McW. MILLAR (Edinburgh), a vice-president of the Section, then took the chair, while Professor E. M. NANSON (Saskatoon) discussed the treatment of tumours of the salivary glands, emphasizing specially the importance of adequate radiotherapy as an adjunct to proper surgical excision. At the Saskatoon Cancer Clinic during the last 25 years there had been 129 benign lesions, of which 111 were in the parotid, 12 submandibular, and 6 ectopic; and 44 malignant, of which 33 were parotid, 10 submandibular, and 1 ectopic. He classified the malignant lesions as adenocarcinoma, muco-epidermoid, squamous, and undifferentiated. He used cobalt for irradiation and no harmful effects had been noted. Describing a small experiment in irradiating the parotid glands of rats, which was not yet complete, he said it appeared possible to reduce their normal salivary tissue by one-third with irradiation.

In the discussion Professor WILLIAM BOYD (Toronto) recalled how he had discovered a lesion in his own parotid, and said how easy it was to overlook such lesions clinically.

Mr. MILLAR said that had Professor ROBERT MCWHIRTER (Edinburgh) been present he also would have stressed the importance of adequate post-operative irradiation for these patients, preferably carried out with radium needles. Professor R. MILNES WALKER (Bristol) stressed that the diagnosis of malignancy could often not be made clinically or on the operating table, and that an early report from the pathologist was essential. Mr. ARNOLD GOUREVITCH (Birmingham) illustrated the difficulties of diagnosis by describing two patients who had distant metastases from parotid tumours which the pathologist had described as benign.

The Electrogastrogram

Mr. H. S. MORTON (Montreal) described his technique in electrogastrography (synchronous recording of the electrical and mechanical activity of the stomach). The results were of no value in localizing lesions in the gut, but might indicate their presence or severity. They offered a good indication of when a vagotomy might be of value in treating widespread regional enteritis, but the operation must be done before fibrotic and other irreversible changes had taken place. Mr. P. W. INGRAM (Winchester) said that, although he had long respected Mr. Morton's work, he had been quite unable to reproduce it himself. If the electrogastrogram was sensitive enough it picked up potentials from the myocardium and thoracic musculature. If simultaneous kymographic tracings were made from the gut, no correlation between these and the electrogastrogram was obtained; undoubtedly emotion might greatly alter the electric impulses recorded. In his view electrogastrography played no part in the diagnosis of duodenal ulcer, gastric ulcer, or cancer of the alimentary tract.

Wednesday, July 22

Prevention and Treatment of Hand Injuries

With the vice-president, WALTER C. MACKENZIE (Edmonton, Alberta) in the chair, Professor J. H. BROTHERSTON (Edinburgh) described the results of an inquiry into all the hand injuries treated at hospitals in the City of Edinburgh during the course of one year. Of 21,750 injuries, 5,854 had involved the hands. The ratio of men to women was approximately 3 to 1, and when the age groups were analysed it was clear that there was a very high peak during the years 15 to 25. Open wounds of the fingers accounted for most of these attendances, and only 10% were represented by fractures. In men, over half the injuries occurred at work, but with women many more occurred at home. About one-third of all the burns treated in hospital involved the hands. Half of the patients treated in hospital required a stay of at least seven days, and of those who had to attend only as out-patients the majority required from one to three attendances. Professor Brotherston concluded that most benefit would probably accrue from preventive measures among the younger people, particularly to education of workers in the use of tools and equipment.

Mr. R. G. PULVERTAFT (Derby) said that in recent years the treatment of hand injuries had improved because of the world-wide interest in surgery of the hand and the recognition that special training in this work was needed, the enthusiasm of the surgeon and precise workmanship being the major requirements. He went on to outline the principles and techniques of treatment in handling skin, bone, tendon, and nerves. The importance of the skin was that minimal excision and careful suture would convert an open into a closed wound. To achieve this end it was often necessary to use grafts which might be partial or complete thickness, or grafts could be swung on a pedicle.

On the subject of bone he stressed the value of internal fixation in the treatment of fractured phalanges and metacarpals and showed how this might be carried out with steel pins or small bone pegs. Primary suture of tendons was only of value on the extensor surface of the hand and wrist, while secondary suture and the use of free tendon grafts were called for in the majority of other tendon injuries. Finally, he touched on the problems posed by nerve injuries. Primary suture found a place only in the treatment of digital nerves, and for the rest delayed suture was usually much more likely to give the best result. After six to eight weeks the ends of the nerves could be trimmed accurately, and the sheath, which had then become thicker, was capable of being sutured with fine wire or other material.

The Facial Smash

Mr. IAN ORR (Preston) then took the chair, and Dr. EVERETT CRUTCHLOW (Montreal) read a short paper on the treatment of major facial fractures. These injuries had increased in Canada tenfold in the last decade as a result of automobile accidents and were often accompanied by wounds of the head, thorax, abdomen, and limbs. Radiological diagnosis was invaluable, and Dr. Crutchlow illustrated this with *x*-ray pictures and tomograms. Immediate recognition, open reduction, and wiring of these fractures were imperative if a good result was to be obtained, and leakage of cerebrospinal fluid was no contraindication. Tracheotomy was often essential and made anaesthesia and subsequent convalescence smooth. Post-operative care consisted essentially in repeated aspiration of the trachea, oral hygiene, and the removal of antral packs at ten days and the wires at the end of four weeks. Saddle nose was best repaired by means of a free bone graft.

In discussion, Mr. Orr asked if coexisting severe injuries should not be treated first, but Dr. Crutchlow stated that only life-saving procedures should take precedence over the reduction of facial fractures.

Open-heart Surgery

Dr. PETER ALLEN (Vancouver) described the experience which his group had obtained in treating more than 120 patients using the Lillehei deWall oxygenator for patients with valvular disease. Six of the operations on the mitral valve had been for re-stenosis and eight for combined stenosis and regurgitation. Where simple stenosis existed this was still treated by closed operation. Of the sixteen mitral patients treated by open operation four had died, one owing to the perfusion, one to technique, another from acute rheumatism, and the fourth from consequent heart failure. He considered that the main indications for open-heart surgery in these patients were for congenital lesions, re-stenosis following a previous operation, associated regurgitation, multivalvular disease, stage-4 stenosis with advanced disability, and thrombus in the atrium with embolic phenomena.

Friday, July 24

Sigmoid Colon Diverticulitis

With the joint president, Professor JACQUES BRUNEAU (Montreal) in the chair, Professor W. C. MACKENZIE (Edmonton, Alberta) re-appraised the indications for operation in sigmoid diverticulitis. He said that the absolute indications for this operation were four: (1) obstruction, (2) haemorrhage, (3) perforation, and (4) the possibility of carcinoma. There was a high mortality for this benign lesion, and this indicated the need for a more aggressive surgical attack, since the mortality from operation was now so much less owing to better diagnosis with barium, the use of antibiotics and blood, electrolyte replacement, and improved anaesthesia. Of his last 33 patients submitted to colectomy for this condition only one had died, and he was over 88 years of age. If the operation could be completed in one stage only a quarter of the time in hospital was necessary compared with multiple stage operations. The new indications for surgical treatment included repeated bouts of acute inflammation, recurrent partial bowel obstruction, persistent urinary tract infection, and the failure of medical management, especially if the patient was over 50 years of age.

Mr. T. MCW. MILLAR (Edinburgh) thought it was important to remove only the bowel affected by diverticulitis and not all of the colon showing diverticulosis. This meant that the average length of bowel removed was between 10 and 20 cm. Where there was a paracolic abscess it should be drained, and when perforation occurred peritonitis demanded laparotomy. In these patients drainage, closure of the perforation or colostomy, or exteriorization of the colon was called for, but resection was sometimes possible. However, in the fit patient with minimal infection and localized disease excision was ideal.

Professor C. A. WELLS (Liverpool) and Mr. J. A. SHEPHERD (Liverpool) contributed to an interesting discussion.

Liver Resection and Liver Failure

With Mr. B. N. BROOKE (Birmingham) in the chair, Mr. RODNEY SMITH (London) gave a short paper on resection of the liver. He pointed out that the proper knowledge of the anatomy of the liver showed that it was composed of two halves with a segmental distribution of blood vessels and biliary channels. Hemi-hepatectomy was not the same operation as lobectomy, since the right lobe overlapped the left, and therefore if the lesion was in the right lobe of the liver hemi-hepatectomy was a much less bloody operation. The major indications for hemi-hepatectomy included benign and malignant tumours, cysts, chronic abscesses, and the results of trauma. He was not prepared to say whether the removal of secondary malignant deposits was worth while, but obviously if these were solitary and had been present for a considerable time after removal of the primary their removal might be to advantage.

Dr. SHEILA SHERLOCK (London) discussed the part liver failure played in the post-operative patient. Distinction should be made between operations on patients with diffuse liver disease, such as cirrhosis, and those with local lesions such as tumours, since the former were much more liable to go into liver failure. Failure of liver function might be suspected if recovery from the anaesthetic was prolonged, the patient confused, jaundice appeared or deepened, fetor hepaticus was noted, or there was a flapping tremor of the outstretched hands. Many factors might contribute to this complication. They included prolonged deep anaesthesia and the unwise use of morphine or other drugs in premedication. Factors during the operation were prolonged hypotension, obstruction to the portal vein or hepatic artery, and the use of long-stored blood for transfusion. Infection might also contribute to diminished liver function. Since these factors might all affect renal function, and since renal damage often accompanied liver damage, the possibility of renal failure complicating the issue should be borne in mind. However, the use of the term "hepato-renal syndrome" was unfortunate, since it tended to camouflage the existence of two separate conditions.

Management of the Diabetic Foot

Professor A. D. MCLACHLIN (London, Ontario) read a paper on the treatment of lesions of the diabetic foot. In his country 2% of all adults were diabetic, and, despite careful medical management, often developed lesions of the toes or feet. Neuritis might precipitate trouble, and in young patients it was doubly desirable to follow a conservative course. Lesions were always much more severe than the appearance of the skin might suggest, and pus tracked deeply. It was first necessary to have the assistance of a skilled physician to control the diabetes, and then to drain pus until infection was arrested. He used delayed primary suture, great gentleness in handling tissues, no tourniquet, and a plaster-of-paris dressing routinely for the first six days. So long as all dead, infected, and anaesthetic tissues were excised as far back as an adequate blood supply, the wound would heal. Sympathectomy was of value in increasing the local blood supply, and antibiotics were used routinely. Where more than a toe had to be removed a transmetatarsal amputation was employed, leaving the wound open in the first place. Subsequently normal footwear could be used with the addition of a steel inlay and sponge-rubber toe-pad. The important thing was to use the plantar skin so far as possible. Of 156 diabetic feet treated on these principles, 62 required no amputation, 42 required some kind of amputation of the foot, and 52 eventually an amputation above the level of the foot. This meant that two-thirds of them required no kind of artificial limb.

SECTIONS OF OBSTETRICS AND GYNAECOLOGY AND ANAESTHETICS

Monday, July 20

Obstetric Anaesthesia

A joint session of the Section of Obstetrics and Gynaecology and the Section of Anaesthetics, presided over by Mr. JOHN PEEL (London), one of the joint presidents of the former section, discussed anaesthesia for obstetric manœuvres and operations.

Professor W. I. C. MORRIS (Manchester) gave the viewpoint of an obstetrician. The presence of the abdominal tumour, the separate interests of the foetus, the frequent need for urgency in intervention, and the added difficulties of maternal complications such as haemorrhage or prolonged labour all added to the anaesthetic risk. Further, the perfect anaesthetic agent, combining safety, comfort, and convenience, was still undiscovered. In England and Wales at present, he calculated, the maternal mortality directly due to anaesthesia was about 0.2 per 1,000 operative deliveries. The commonest cause of a maternal anaesthetic death was inhalation of vomit, and even the most careful techniques could not completely obviate this risk. Local and regional analgesia were valuable but not without demerits. Their superior safety to the mother was not completely proved; they were less comfortable to patient and obstetrician than general anaesthesia, and to some degree they restricted the choice of operative procedure. In some emergencies, such as prolapsed cord, where speed was imperative, the advantages of intravenous anaesthesia might be nullified by difficulty and delay in administration.

Dr. W. D. WYLIE (London), an anaesthetist, thought traditional methods with chloroform, ether, and the lateral position of the patient, though still commonly used, were not as safe as modern techniques using relaxants and a cuffed endotracheal tube; nor did they produce ideal conditions for the obstetrician. Inhalational anaesthesia without a cuffed endotracheal tube could not always, even in experienced hands, ensure full control of the mother's airway, and must produce a depth of anaesthesia sufficient to affect

the baby to some degree if the obstetrician's convenience was to be considered. These factors were even more important when mother or baby, or both, were already at risk for obstetrical reasons. Not only must maternal deaths be prevented but also the less obvious, but equally avoidable, maternal and foetal sequels to general anaesthesia. Local analgesia was most valuable in suitable cases.

Dr. J. J. CARROLL (Vancouver), also an anaesthetist, emphasized that the anaesthetist should be clearly informed of the obstetrician's requirements in the individual case and then choose his methods and drugs accordingly. In his unit self-administered "trilene" (trichlorethylene) was no longer permitted because they had noted an increased incidence of neonatal atelectasis where trilene had been so used for long periods. Cyclopropane was valuable for rapid induction, but should not be given for more than three minutes before delivery of the baby. In his practice tranquillizers were given from the outset of labour, supplemented by pethidine as required. With premature babies epidural analgesia was generally used for delivery by episiotomy and forceps extraction, and either epidural or spinal analgesia was the rule for caesarean section.

In the subsequent general discussion, to which Dr. R. A. GORDON (Toronto) and Mr. BRYAN WILLIAMS (Middlesborough) contributed, it became apparent that practices on the two sides of the Atlantic were not strictly comparable because of differences in the proportion of women delivered in hospital, in attitudes of doctors and patients, and in availability of fully trained anaesthetists.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Early Diagnosis of Gynaecological Cancer

The anaesthetists having departed, the Section of Obstetrics and Gynaecology, under the chairmanship of Professor R. J. KELLAR (Edinburgh), a vice-president of the Section, went on to discuss the early diagnosis of cancer of the female reproductive organs. Mr. W. G. COSBIE (Toronto) pointed out that, as the outlook for the patient was usually determined by the stage of her cancer at first treatment, lay education was tremendously important. The work of the Canadian Cancer Society in this field since 1938 had borne fruit as shown by the increasing proportion of women who sought treatment within a month of their first symptom—from 17% in 1946 to 39% in 1955. Further, changes in the teaching of medical students and graduates had prompted doctors to seek earlier diagnosis, and both of these factors had combined to increase both the proportion of cancers seen in the earlier stages and the net survival rates. In fact, two-thirds of the improved results could be ascribed to earlier diagnosis as compared with one-third due to improved methods of treatment.

The value of cervical smears, continued Mr. Cosbie, in detecting unsuspected pre-invasive and frank cancer had been proved beyond all doubt, and cytology services were being made available to all doctors in more and more areas. Dr. Cosbie thought that further extension of smear screening should ensure a further decline in the mortality from uterine cancer.

Cancer Detection Clinics

Dr. HENRIETTA BANTING (Toronto) said that a "well-woman" clinic for cancer detection had been opened by the Women's College Hospital in Toronto in 1948, and public acceptance had grown into public demand to such an extent that they could not now accept all requests for examination. About half of the 25,000 women seen had returned at least once for re-examination. Attendance was open *only* to women with no specific complaint. The family doctor was notified of the woman's attendance and of the findings, and any treatment required was left to him. A full history was taken and full physical examination performed, followed by cervical smear, chest radiography, urinalysis, haemoglobin estimation, white-cell count, and Wassermann reaction. Among these symptom-free women 114 neoplasms had been found during the ten years of the clinic (0.68%). Cancers of the skin, cervix, and breast (in that descending order of frequency) accounted for 95 of the 114. Of the 32 cervical carcinomas only one was other than pre-invasive, but several women with suspicious smears were lost sight of, and the clinic could not keep as adequate a contact with the patient as could her family doctor. The latter, therefore, should take a smear at least in every gynaecological examination, because although comparative statistics indicated that only about one-third of pre-invasive carcinomas of the cervix progressed to frank malignancy, every carcinoma-in-situ was completely curable.

The cost per examination was $18, of which they charged the patient $15. It cost about $4,000 to detect one single cancer—hardly an economic procedure. Her conclusions were that cancer-detection clinics were not the answer to the problem of detecting early cancer; the family doctor could do it more effectively and more economically. But such clinics promoted the principles of preventive medicine in relation to cancer and were valuable in educating both public and doctors in this field.

Mr. THOMAS PRIMROSE (Montreal) reported that vigorous postgraduate teaching of general practitioners and the positive attitude of the public had combined to popularize the cervical smear procedure. In the Royal Victoria Hospital, Montreal, an attempt was also being made to detect early cancer of the endometrium by cannula aspiration of the uterine cavity in older women with "spotting" or uterine discharge. Altogether, the cytology centre had in 1945–58 tested nearly 75,000 women for gynaecological cancer, many of the slides being sent in by post, and positive smears had numbered 1,288 (1.7%). A reliable cytology centre was of enormous benefit; the average Canadian was prepared to pay for this service, and funds were available for those who could not afford the fees.

In the general discussion Professor H. M. CAREY (New Zealand) said that in New Zealand things seemed cheaper, because they reckoned it cost them only £100 for each neoplasm detected by smear.

Tuesday, July 21

Third Stage of Labour

Dr. W. G. COSBIE (Toronto), one of the joint presidents, occupied the chair when Mr. DONALD B. FRASER (London) gave the opening paper on the management of the third stage of labour. The problem had always been whether the attendant should be active or passive. The influence of Smellie and others had led to a conservative approach, the third stage being left to manage itself except when the physiology of placental separation was abnormal. More recently, the development of the effective oxytocic ergometrine had resulted in a new phase of active intervention whereby the third stage might be eliminated by giving this drug at the close of the second stage.

Mr. Fraser thought it illogical to inflict this drug as a routine on an efficient physiological process, with the resultant possibilities of active uterine retention of the placenta or of an undiagnosed second twin. The woman who had delivered herself of her baby would, if given the chance, nearly always deliver the placenta without complications. The normal case should be differentiated from the potentially abnormal, and prophylactic intravenous ergometrine should be reserved for women who seemed more likely than most to bleed in and after the third stage. Such patients included those with a previous history of such haemorrhage, those with twins or hydramnios, and those whose labours had been prolonged or been terminated under general anaesthesia.

Hypofibrinogenaemia

Dr. J. K. FEENEY (Dublin) listed no fewer than 25 complications of pregnancy with which there might be associated clotting defects of blood, but concentrated on

those with special relevance to the third stage. Hypofibrinogenaemia was rare, but important because it was likely to be fatal unless promptly diagnosed and promptly treated. He believed that iso-immunization played some part in the production or aggravation of hypofibrinogenaemia. The specific remedy was reconstituted dried human fibrinogen or triple-strength plasma, but use of the latter involved some risk of homologous serum jaundice. Of the rapid bedside tests for fibrinogen depletion, simple clot observation, Schneider's test, and the fibrinogen index were the most convenient.

He believed that if the uterus in accidental haemorrhage was tender some degree of clotting defect was already present. The critical level of plasma fibrinogen for haemorrhage was about 100 mg./100 ml. With retention in the uterus of a dead foetus, whether due to Rh-iso-immunization or not, there was also a danger of hypofibrinogenaemia, and therefore apposite tests should be performed at intervals up to the time of delivery.

Dr. C. W. WALKER (Cambridge) then discussed the third stage of labour from the viewpoint of a general-practitioner–obstetrician. The three dangers were sepsis, shock, and haemorrhage. In the home sepsis was prevented primarily by the use of soap-and-water and antiseptics. With the patient in the left lateral position during the third stage and a sterile towel placed over her abdomen, the doctor could guard the fundus and still be in a good position to prevent wound infection. In his 573 home deliveries the perineal sepsis rate was 4%.

With regard to shock, there seemed to be some cases where prostration after delivery, probably psychogenic, caused uterine laxity and so haemorrhage. Handing the baby as soon as born to the mother prevented this by stimulating an immediate maternal interest. With reference to third-stage bleeding, 35 of his 573 parturients (6%) had bled sufficiently to cause anxiety. Even if all primigravidae and all multiparae with a history of previous postpartum haemorrhage were excluded from domiciliary confinement, 2.2% of those delivered at home would have significant bleeding, although only a quarter of them would require transfusion.

Complications

Dr. A. W. ANDISON (Winnipeg) reminded the audience that the third stage of labour was the most dangerous one. In 1954–6, 117 women in Canada died from retained placenta and/or postpartum haemorrhage—12% of all maternal deaths. But in 1950–8 in Winnipeg General Hospital only one patient had been lost in this way out of over 33,000 vaginal deliveries. In the absence of bleeding the duration of the third stage should not be allowed to exceed 30 minutes before the placenta was manually removed. But if the patient with a retained placenta was deeply shocked, her general condition must be improved before this operation was performed, intravenous ergometrine being given to control any bleeding in the interim.

The best emergency treatment for bleeding after delivery of the placenta, continued Dr. Andison, was bimanual abdominal massage of the uterus. If the bleeding continued or recurred thereafter the uterine cavity should be explored. Subsequently an oxytocin drip would maintain uterine tone, but it should not be used if the woman had had cyclopropane anaesthesia.

From the floor, Dr. M. G. PEARSON (Edinburgh) described a case of postpartum haemorrhage complicated by adrenocortical insufficiency from which the patient recovered completely. Mr. J. V. O'SULLIVAN (London) supported Mr. Fraser's conservatism, while Dr. H. J. H. CLAASSENS (Cape Town) did not agree that prophylactic intravenous ergometrine increased the need for manual removal of the placenta.

Prematurity

With Dr. E. A. GERRARD (Manchester), a vice-president of the Section, in the chair, the problems of prematurity were then discussed. Professor CARL W. R. TUPPER (Halifax, Nova Scotia) stated that prematurity accounted for over 28% of the perinatal mortality. In 60% of cases of prematurity the cause was not discovered. Where a causal factor was found antepartum haemorrhage (18.6% of the total), toxaemia (10%), and multiple pregnancy (6.5%) were the most frequent. Twice as many mothers of prematures had had a previous abortion or premature labour as had mothers of mature babies. In his department they considered that abortion might be of the nature of a collagen disease, probably psychosomatic in origin. Certainly women with habitual abortion given close psychological support throughout pregnancy showed a much higher foetal salvage rate than others. In 28 of 43 cases of prematurity the placenta had shown proliferative collagen lesions and the maternal serum had contained a sheep's R.B.C.-agglutinating factor. These findings suggested that abortion and premature labour might reflect the response of the pregnant woman to stress.

Dr. F. E. BRYANS (Vancouver, B.C.) grouped the known causes of prematurity into maternal and foetal-placental. The former group was further subdivided into, first, conditions existing before the pregnancy, whether general such as hypertension or diabetes, or local such as anatomical abnormalities; and, secondly, complications of pregnancy, notably toxaemia and Rh-iso-immunization but including mistimed elective section. In all these conditions premature induction might be needed in the interests of mother or baby.

In the foetal-placental group, continued Dr. Bryans, multiple pregnancy was a major factor. Hospitalization over the 32nd–35th week might prevent premature labour at a time when the baby would be in greatest hazard. In placenta praevia expectant treatment was often life-giving for the foetus.

Paediatric Aspects

Paediatric aspects of prematurity were reviewed by Dr. PAUL R. SWYER (Toronto). Over 60% of the total neonatal mortality in Canada in 1956 was in premature babies. In some groups, such as with toxaemia or birth injury, there was a special problem apart from the prematurity. The specific hazards of prematurity were mainly pulmonary, with atelectasis and hyaline membrane disease outstanding, but metabolic disorder was not uncommon. Most of these babies died within the first 24 hours, so that treatment, to be successful, must be urgent. The chances of survival depended on length of gestation as well as on birth weight. Among the survivors there was a serious incidence of neurological damage, especially if the birth weight was below 1.5 kg. The task of the paediatrician, therefore, was to increase not only the survival rate but the number of healthy normal survivors.

The puny premature was often unable to make the muscular effort to develop the high negative pressure needed to initiate air-entry. The routine inflation of the lungs of all small prematures by endotracheal intubation and controlled positive pressure was therefore worthy of consideration. Artificial respirators were being designed, and the use of the cord as a means of adding a pump oxygenator to the neonatal circulation was being tried in experimental animals.

Thursday, July 23

Dysfunctional Uterine Bleeding

Professor ELINOR BLACK (Winnipeg), a vice-president, took the chair when Dr. J. L. MACARTHUR (Montreal) gave the opening paper on dysfunctional uterine haemorrhage, which he defined as abnormal bleeding without demonstrable cause. The bleeding varied in amount, duration, and frequency. It occurred at any age from puberty until beyond the menopause, and from any type of endometrium. It might be associated with organic lesions, such as fibroids or adenomyosis, but without being caused by them.

Dr. ARTHUR M. SUTHERLAND (Glasgow) reviewed his findings in three studies—1,000 cases of presumed dysfunctional bleeding, 1,000 cases of abnormal bleeding in the presence of gross pelvic disease, and 200 cases of abnormal

bleeding in women under 21 years of age. His conclusions were, first, that the histological picture could be overemphasized, for he himself found the endometrial histology very similar in the "dysfunctional" and "organic" groups; secondly, that in the youngest group endometrial hyperplasia was not common (15.5%), but endometrial tuberculosis was not uncommon (4%); and, thirdly, that curettage was imperative at any age both to exclude organic disease and because it had curative effect in many cases.

A Plea for Conservatism

Dr. T. N. MACGREGOR (Edinburgh) pointed out that before treatment was initiated for dysfunctional bleeding it was very important to rule out organic lesions, local and general, as well as psychogenic bleeding. Ovular types of menorrhagia were often difficult to control; androgens in effective dosage were likely to cause unwelcome side-effects, but the new progestogens might prove to be effective. Surgery was the last resort, and conservative operations such as utriculoplasty might be considered in women under 38. In women over 40, if the imperative diagnostic curettage was not curative, hysterectomy was usually performed, but in this group, too, a more liberal use of hormone therapy might tide the patient over until the normal menopause came to her final rescue.

These three papers evoked a lively discussion.

Maternal Mortality Study Committees

Professor J. ROSS VANT (Edmonton, Alberta) said that the stimulus to form concerted groups in the form of maternal mortality committees began to be felt only 30 years ago, culminating in the inauguration by Williams in Philadelphia of this unique type of searching analysis of all maternal deaths. The modern concept of such a committee was of a body to investigate the deaths of all women from any cause during pregnancy or within 90 days of its termination, to analyse the factors, to assess preventability, and thus to improve teaching and practice. The members should comprise obstetricians and general practitioners, with a pathologist and an anaesthetist, to a maximum number of seven in all; but they should be able to consult colleagues in all related professional and administrative fields. All investigated cases should be anonymous and all facts confidential, and all findings and recommendations should absolve the committee members from legal attack. The committee, meeting quarterly and publishing an annual report, should advise the doctors and hospitals concerned of their findings, not critically, but analytically and instructively.

In Alberta such a committee had functioned since 1929. Between 1936 and 1958 the maternal death rate had fallen from 5.8 to 0.4 per 1,000. In 1956–8 deaths from abortion and ectopic pregnancy had fallen to one-seventh, from dystocia to one-ninth, from sepsis to one-thirtieth, and from haemorrhage to one-fifth of the 1936–40 figures, when the births were fewer by one-fifth. The caesarean section rate had remained steady at about 3%, but deaths from obstetric trauma had fallen to one-sixth. The percentage of women delivered in hospital had increased from 75 in 1936 to 98 in 1956, but the incidence of toxaemia had remained unchanged at 10%, although its severity had been diminished and the death rate from it had been quartered.

(To be continued)

Mr. C. S. Bangay has retired from the London Executive Council, to which he has been clerk since 1953. He began service with the London Insurance Committee in 1913. For nearly six years Mr. Bangay was editor of *The Officer*, the journal of the Association of Officers of Executive Councils and Pricing Committees, and was president of the association in 1957–8. The London Executive Council, at its meeting on March 26, recorded its appreciation of Mr. Bangay's services. Mr. L. P. Willis, of Bradford, succeeded Mr. Bangay on April 1.

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Nitrofurantoin B.N.F.
Furadantin (Duncan, Flockhart).

This is N-(5-nitro-2-furfurylidene)-1-aminohydantoin, and it is made up in 50-mg. tablets. It is indicated in certain infections of the urinary tract due to bacteria sensitive to its action, including those usually resistant to other chemotherapeutic or antibiotic agents — for example, *Bacillus proteus*, *Pseudomonas aeruginosa*, *Aerobacter aerogenes*, and *Escherichia coli*.

The drug is given by mouth on a basis of 5 to 8 mg. per kg. (2.2 to 3.6 mg. per lb.) body-weight in 24 hours in four divided doses, after meals or with cold milk. An average dosage schedule is 100 mg. four times daily for 7 days. The drug is said to be useful also for long-term treatment and control of chronic urinary-tract infections, especially in children.

With higher-dosage schedules nausea, heartburn, and vomiting are common side-effects. These may lead the physician to give lower doses, but if this is necessary bacterial resistance is more likely to develop. Again, when two or more organisms are causing a mixed infection, the percentage of negative cultures after treatment falls considerably, regardless of the dosage. This is particularly true of Gram-positive resistant organisms, against which nitrofurantoin is likely to be unsuccessful, relapse being common several weeks after the completion of the treatment. It is important not to administer the drug without ascertaining whether the patient has a "surgical" infection causing obstruction of the urinary outflow.

Phenylbutazone B.N.F.
Butazolidin (Geigy).

Phenylbutazone, which is chemically related to aminopyrine, has the following composition: 3:5-dioxo-1.2-diphenyl-4-n-butyl-pyrazolidine. It is rapidly absorbed when taken by mouth and slowly metabolized in the body; about 10% is excreted unchanged in the urine.

Therapy.—Phenylbutazone will often relieve patients suffering painful symptoms in certain diseases of the bones and joints. These include gout, osteoarthritis, ankylosing spondylitis, and rheumatoid arthritis. It may also give relief in cases of Paget's disease and metastatic carcinoma of bone. Not more than 400 mg. a day should be administered if treatment is to be continued for more than a week. Side-effects are distinctly commoner when this dosage is exceeded, though they may also occur at lower dosage.

Generally, the drug is best given by mouth. It can be given intramuscularly, though this may be painful; to prevent the pain, a preparation of phenylbutazone 600 mg. in 1% lignocaine is available. Injections are usually given twice or thrice weekly.

Toxicity.—The most frequent toxic effect is dyspepsia; occasionally haematemesis or melaena may occur. Other toxic effects reported include retention of water, with oedema, and rashes. Agranulocytosis, though a serious toxic effect, is rare; buccal ulceration unconnected with any change in the bone marrow or circulating blood cells is not uncommon.

If symptoms of intolerance appear, they usually do so within three weeks of beginning treatment, and often within four days.

Contraindications.—Dyspepsia, with or without peptic ulceration; a history of allergy to drugs, or of blood dyscrasia. It should be given only with extreme caution, if at all, to patients with congestive heart failure or degenerative disease of liver or kidneys.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Alpha-Chymotrypsin in Cataract Surgery

SIR,—With reference to your recent annotation on alpha-chymotrypsin in cataract surgery (*Journal*, August 1, p. 120), a note of caution must be sounded on the reported absence of complications; for I have seen a case of corneal vascularization following the use of this enzyme in the anterior chamber.[1] Fortunately it was not severe enough to impair the vision.

It is too early to appraise this new technique in cataract surgery, and at present it would seem advisable to restrict it to properly controlled trials, and cases where it is essential in order to obtain an intracapsular extraction.—I am, etc.,

St. Bartholomew's Hospital, London, E.C.1. D. W. HILL.

REFERENCE

[1]Hill, D. W., *Brit. J. Ophthal.*, 1959, **43**, 325.

"Nestosyl" Aerosol

SIR,—I was interested in the letter by Mr. Michael Bates (*Journal*, August 15, p. 191) on the use of a local anaesthetic aerosol for bronchoscopy. I and some colleagues of mine have been attempting to evaluate the usefulness of this preparation (nestosyl) in the aerosol form for the production of local anaesthesia in general practice. An effective local anaesthetic such as this in aerosol form could be extremely useful for undertaking minor surgery, particularly in children. In addition, the preparation is also recommended for using in a number of conditions where it is desired to produce local anaesthesia for the relief of symptoms. Accordingly the cases, of which there was a total of 49, were divided into a group involving single procedures and a group involving multiple applications.

The single procedures included skin and perineal suturing, incision of whitlows, removal of warts and subcutaneous foreign bodies, removal of painful dressings, etc. The conditions treated by frequent applications included haemorrhoids, anogenital pruritus, dermatitis, varicose ulcers, burns, painful wound dressings, etc. In the majority of single applications, as for minor surgery, complete or partial anaesthesia was obtained. However, anaesthesia was not satisfactory for suturing skin and perineal lacerations. In most cases anaesthesia developed in 2–5 minutes, and 4 minutes would appear to be the minimum time to allow between applying the spray and undertaking the minor surgical procedure. In the medical conditions treated with frequent applications a satisfactory anaesthetic effect was obtained in the majority of cases also. The duration of this effect was very variable, lasting from one hour to all day in different cases. The majority of haemorrhoid cases cleared up satisfactorily in one to three weeks with the aerosol, but many of the cases of anogenital irritation required other treatment. This may well be because usually in this condition there is secondary infection, and appropriate antibacterial treatment is required in addition to symptomatic applications. One case of varicose ulcer and another of pressure sores healed up unexpectedly following the use of the aerosol.

Side-effects were not particularly marked, 57% of patients not experiencing any at all. However, initial stinging was experienced in 35% of cases, although this was seldom severe enough to necessitate the omission of treatment. The only other side-effect of any importance was one case of sensitization rash, a recognized hazard with the local application of benzocaine preparations. Provided this is recognized and the therapy stopped, should it appear, it provides no serious contraindication to the use of the preparation.

It was concluded that there is a definite place for the use of this aerosol in general practice, although it is apparent that the spray does not penetrate intact skin, and therefore its usefulness is limited in minor surgery. I am indebted to Dr. P. Schofield, of Weybridge, and Dr. A. K. Cumming, of Stalbridge, for assisting in this investigation.—I am, etc.,

Twickenham, Middlesex. DAVID WHEATLEY.

Anticoagulants with Digitalis

SIR,—The treatment of patients with combined valve disease, whose heart is enlarged to a great extent, is even in clinical practice a very hard problem. The doctor who attempts to treat the congestion faces the danger of embolism. The intensive digitalization increases the strength of contraction of cardiac muscle, and that may cause embolism. On the other hand, often no effect can be obtained by any other means (bed rest, restriction of salt, diuretics, etc.). For such difficult cases we have elaborated a new scheme of therapy which consists in giving digitalis under the protection of anticoagulant therapy.

We generally start with dehydration of the patient, who is kept on strict bed rest. If the desired effect is not reached, anticoagulant therapy is established; two to three days later a purified digitalis preparation is started cautiously. The anticoagulant therapy is then continued for the customary long time.

We are inclined to think that in this way the danger of embolism is diminished. The combined therapy perhaps does not abolish the possibility of this complication, but lessens its risks. In our practice no embolism occurred under this treatment. Side-effects were not observed. The value of the above therapy, however, could be assessed only from experience in a large number of cases.—I am, etc.,

University of Debrecen, Hungary. J. HANKISS.

Porphyrins in Stools

SIR,—It has recently been shown[1 2] that the familial type of porphyria, which is by no means rare in the white population of South Africa, is characterized by considerably increased faecal excretion of copro- and proto-porphyrin. Normal stools do not contain more than about 15 μg. of the former and 45 μg. of the latter per g. dry weight, whereas those from patients with the cutaneous and/or acute systemic disturbances, which are features of this form of porphyria, usually contain several hundred micrograms of each of these pigments. Some apparently normal members of affected families excrete similar large amounts of porphyrins in their stools and are regarded as latent porphyrics who may at any time develop the clinical manifestations.

Patients with porphyria, whether latent or manifest, are peculiarly sensitive to several drugs, including barbiturates; and since acute episodes may simulate very closely abdominal conditions requiring sedation and surgical intervention, for which thiopentone will probably be administered, examination of faeces provides a valuable screening test in doubtful cases. In the frank

porphyric other features usually enable the diagnosis to be made with reasonable confidence, but it is sometimes difficult to assess the significance of increased faecal porphyrins, which may be only moderate, when the patient's personal and family histories are equivocal or negative.

It is known that bacteria present in the gut can degrade haemoglobin and produce proto- and other porphyrins which behave similarly during the course of the analysis. Trials on several melaena stools did not, however, suggest that gastro-intestinal haemorrhage would be an important complication, since in these the copro-porphyrin was virtually normal and protoporphyrin raised to only 120–150 μg. A recent experience shows that greater deviations affecting both fractions can sometimes occur.

Faeces from a young adult male candidate for gastrectomy contained coproporphyrin 209 and protoporphyrin 960 μg. per g. dry weight, upon which finding operation was deferred. Repeat analysis two weeks later showed C.51, P.90. Both these stools gave strongly positive tests for occult blood. Apart from epigastric pain there were no clinical features of porphyria, and the family history was negative. Ten weeks after the first observation faeces from the patient contained C.13, P.40 μg.—i.e., within normal limits—and occult blood tests were negative. Slightly raised stool porphyrins (C.71, P.94) were found some weeks later following a recurrence of bleeding, and a laparotomy was performed. A Meckel's diverticulum was removed, which showed an area of heterotopic gastric mucosa and evidence of recent ulceration. Foreign-body granulomata deep in the wall also indicated past ulceration.

Liberation of porphyrin from haemoglobin to the extent found in the first specimen seems to be uncommon, for many stools containing occult blood have given normal results for porphyrins. Attention is, however, drawn to this possibility of error and the point is receiving further attention. Meanwhile it is suggested that this may be the explanation of the findings in some of the cases described as hyperporphyrinism in an earlier paper in this *Journal*.[3]—We are, etc.,

South African Institute for Medical Research, Johannesburg. H. D. BARNES.

Provincial Hospital, Port Elizabeth. G. DEAN.

REFERENCES

[1] Barnes, H. D., *S. Afr. med. J.*, 1958, **32**, 680.
[2] Dean, G., and Barnes, H. D., ibid., 1959, **33**, 246.
[3] —— *Brit. med. J.*, 1958, **1**, 298.

Ileal Argentaffinoma and Intussusception

SIR,—With reference to the medical memorandum by Mr. E. T. McCartney and Dr. I. Stewart (*Journal*, March 21, p. 769) concerning argentaffin tumours of the ileum as a cause of intussusception, we would like to report the following case.

A male patient, aged 66, was discharged from hospital on March 27, 1958, following a Millin's retropubic prostatectomy, which had been performed to relieve acute retention arising after an operation for the repair of an inguinal hernia, for which the patient had originally been admitted. He remained at home for two weeks and then was sent to a convalescent home. Within twelve hours of his arrival he developed acute, colicky, abdominal pain, with vomiting associated with absolute constipation. He was readmitted to hospital on April 13, 1958.

Examination revealed a dry tongue, distended, tender abdomen, with high-pitched bowel sounds and an empty rectum. A plain *x*-ray examination of the abdomen confirmed the diagnosis of small-bowel obstruction. An immediate laparotomy was performed, and an irreducible, ileo-colic intussusception was found. The latter was resected and an end-to-side ileo-colic anastomosis performed. Recovery was uneventful. Examination of the resected specimen showed an irreducible intussusception, ileo-colic in type, with evidence of local gangrene at the apex of the ileum. A large, firm ileal tumour, 3 in. (7.6 cm.) by 2 in. (5.1 cm.) in size, was the apex of the intussusceptum. Section (Dr. R. S. Ralph) showed the classical picture of a carcinoid tumour.

It is interesting to note that, though these tumours occur relatively commonly in the sixth and seventh decades of life, Ariel[1] found only two cases where the growth led to an intussusception over the age of 30 years, one a male of 32 and another of 52 years. It would seem that this is the oldest recorded instance, and it confirms the importance, as pointed out by Mr. McCartney and Dr. Stewart, of careful macroscopic and microscopic search for the presence of a tumour in the intussusceptum. Unfortunately, as commonly occurs in these cases, the presence of secondary deposits was not excluded at operation. However, the patient had had no symptoms or signs referable to such a tumour prior to the acute episode, and has remained in good health since. We are grateful to Mr. R. S. Lawrie for permission to publish the details of this case.—We are, etc.,

H. J. GRAVER.
London, S.E.5. J.-C. GAZET.

REFERENCE

[1] Ariel, I. M., *Arch. Path. (Chicago)*, 1939, **27**, 25.

Ruptured Urethra

SIR,—A modification of previously described technique has been used in two recent cases of ruptured membranous urethra.

After the suprapubic and urethral sounds are got end on and the urethral sound has been advanced into the bladder, the problem then remaining is to replace this sound with a self-retaining catheter. The method used was to put a slip-knot on the end of a long length of stout silk and to tighten it on the sound proximal to the olivery end. While traction was maintained on the silk the sound was withdrawn, taking with it, of course, the slip-knot end of the silk. It was then a simple matter to tie this end of the silk through the eye of a Foley bag catheter, which was then drawn up into the bladder by traction from above.

This method was found more effective than that usually described of putting a catheter (proximal end) over the end of the urethral sound and withdrawing this down the urethra, for it is most difficult to keep the catheter on the end of the sound as it is withdrawn. There was no such difficulty with the slip-knot used, as described.—I am, etc.,

C.W.M. Hospital, Fiji. J. M. FOREMAN.

Qualification in Medicine

SIR,—I would like to support the plea made by Dr. G. O. Morse in the *Journal* of August 15 (p. 190), that serious consideration might be given to having one M.D. qualification, supplemented by memberships of colleges and by the various diplomas in special subjects. My present work brings me into contact with people in many countries, and I am constantly meeting the sense of confusion over the meaning or the values of our dozen or more different sets of letters. It would, I think, be a small contribution to the sense of unity of

the profession the world over if we were able in this way to sink our traditions and come up with one general qualification. I suspect you have no space for me to detail some of the many difficulties that arise in making lists for international use of people who, in this country alone, have these special letters after their names, which are quite meaningless to their colleagues elsewhere.—I am, etc.,

London, W.1. J. R. REES.

SIR,—Is not Dr. G. O. Morse (*Journal*, August 15, p. 190) pointing out the same paradox in clinical education so clearly underlined on page 177 of the study by Spence *et al.*[1]? "On the one hand, there were, during the first year of life, 1,400 infective illnesses nearly all requiring precision in diagnosis and treatment, but few of which are studied or presented for teaching in hospitals, and, on the other hand, there were 18 illnesses such as intussusception, meningitis, and osteitis which are the classical material of teaching hospitals."—I am, etc.,

Aldershot, Hants. F. G. NEILD.

REFERENCE

1 Spence, J., Walton, W. S., Miller, F. J. W., and Court, S. D. M., *A Thousand Families in Newcastle upon Tyne*, 1954. Oxford University Press.

PAM

SIR,—With reference to the letters from Drs. T. Guthe and M. G. Jones (*Journal*, August 15, p. 189), may I add melphalan (phenylalanine nitrogen mustard) to the list of substances for which PAM is the "commonly accepted abbreviation"? The description of substances by their initial letters may be all very well within the limited confines of the research laboratory, but on prescriptions such a practice is fraught with serious danger.—I am, etc.,

JOHN B. LLOYD.
Chief Pharmacist,
Manchester Royal Infirmary

Manchester, 13.

Water Intoxication

SIR,—I was interested to read the case report of water intoxication by Dr. R. Emery (*Journal*, August 15, p. 190), as we recently had a similar case admitted as an emergency to this hospital.

A man, aged 29, was admitted to the casualty department unconscious, with a history from relatives of having taken large quantities of water for approximately 2 to 3 weeks and also of passing large amounts of urine. An exact estimation was impossible, but it was reported that he had passed approximately two gallons (4.5 litres) of urine on the day of admission. He had recently been discharged from a mental hospital with a diagnosis of schizophrenia. While in the casualty department he remained unconscious and had six major epileptiform fits in succession. His electrolytes at that time were: chloride, 425 mg.% (normal 560–620 mg.%); sodium, 270 mg.% (normal 325–350 mg.%); potassium, 15 mg.% (normal 18–22 mg.%); and blood urea, 15.5 mg.%.

In an attempt to correct his electrolyte imbalance he was given hypertonic saline intravenously. Consciousness was regained over the next 2–3 hours. Electrolytes the following day were: chloride, 631 mg.%; sodium, 315 mg.%; potassium 14 mg.%. By this time he had completely recovered. His fluid intake was restricted to 4 pints (2.3 litres) daily, and in view of his low serum potassium he was given potassium chloride 1 g. t.d.s. Electrolytes three days after admission were normal.

He now appears to be able to drink large quantities of water with little or no effect. His drinking habits have had to be severely restricted to prevent a recurrence.—I am, etc.,

St. Olave's Hospital, London, S.E.16. T. J. CARTER.

Risks of Immunization

SIR,—The *Journal* of May 23 (p.1342) contained two interesting papers dealing with risks of immunization, read at the Wellcome Foundation Symposium on "Immunization in Childhood." Two suggested schedules are given for immunization in childhood, and in both smallpox vaccination is postponed until some time between 1 and 5 years old. This change to a later age is advocated on statistical evidence of a higher complications rate in infants vaccinated in the first year of life than after the age of 1.

In the years 1953–7 some 1¼ million children under 1 year of age were vaccinated and amongst them are recorded 4 deaths from generalized vaccinia and 9 deaths from encephalitis.[1] Three of the deaths from generalized vaccinia occurred in infants with agammaglobulinaemia. Such children rarely survive childhood. The fourth death was in an infant with infantile eczema, vaccinated to conform with emigration laws. Of the 9 deaths attributed to encephalitis, the post-mortem findings in two infants were consistent with encephalitis. Of the remaining 7, post-mortem findings showed that three died of bronchopneumonia, one of enteritis, and in three no definite cause of death was established. One of these 3 infants was found dead in her cot the day following vaccination.

The present accepted optimum age for smallpox vaccination suggested by the Ministry of Health is the fourth month.[2] At this age the infant is still attending the general practitioner and the health visitor paying routine domiciliary visits. In such circumstances it has been possible to get some 35% of infants vaccinated. I doubt if even this low acceptance rate will be maintained if vaccination is postponed until after the first year. Before advocating this change in policy, I should like to hear other opinions.—I am, etc.,

Near Falmouth, Cornwall. E. R. HARGREAVES.

REFERENCES

1 *Annual Report of the Chief Medical Officer of the Ministry of Health for 1957*. H.M.S.O., 1959.
2 *Memorandum on Vaccination Against Smallpox*, 1956. H.M.S.O.

Anaemia after Gastrectomy

SIR,—Your leading article entitled "Anaemia after Gastrectomy" (*Journal*, August 8, p. 147) calls attention to the prevalence of hypochromic anaemia following partial gastrectomy. We have recently obtained evidence that cyanocobalamin deficiency, as reflected in the serum vitamin-B_{12} levels, is much more common than the reported incidence of megaloblastic anaemia would suggest. In 22 patients one and a half to two and a half years since partial gastrectomy the mean serum level was 265 $\mu\mu$g./ml., and in one case the serum level was below our lower limit of normal; while in 10 patients seven and a half to eight and a half years after operation the mean level was 165 $\mu\mu$g./ml., with four

below normal. None of these had macrocytosis. We are continuing this study, but in the meantime the possible existence of subclinical vitamin-B_{12} deficiency in these patients should be borne in mind.—We are, etc.,

B. W. MEADE.
P. F. J. SEWELL.

Kingston Hospital, Surrey.

A Granular Pharyngitis

SIR,—For the last two years I have come across an illness not previously described as far as I am aware. The main feature is an acute or subacute follicular pharyngitis. It is extremely common, especially in autumn and spring, much more common than ordinary tonsillitis, and affects mainly young adults between 20 and 45.

Clinical features are severe dysphagia, with a dry and sore throat characterized by marked swelling of the follicular tissue of the pharynx, which has a granular glazed appearance. This, in the acute stage, is often accompanied by pyrexia up to 102° F. (38.9° C.), enlargement of the vertical anterior glands overlying the carotid region, and occasionally swelling of the occipital glands with slight neck rigidity. The temperature may last several days, but dysphagia may persist up to three weeks or longer. In the subacute form there is no pyrexia.

Throat swabs have been persistently negative, but, unfortunately, there has not been any opportunity for identification of virus infection. In two cases, following influenza, there was a pure growth of *Haemophilus influenzae*.

The illness is characterized by resistance to any form of treatment, lozenges, gargles, and inhalants having practically no effect. In a few cases tetracyclines may have accelerated the natural recovery. There is no accompanying conjunctivitis, but at times the postnasal adenoid tissue seems to be affected too. The infectivity within the family circle is very low.

This is probably another manifestation of the adeno-virus group of infections.—I am, etc.,

Nottingham. G. FIELDING.

Family Planning Association

SIR,—May I write to clear up any confusion that might arise in the minds of your readers from the letter of Dr. F. F. Hellier in the *Journal* of August 8 (p. 154) where he sought to distinguish between the work of the Marriage Guidance Council and the Family Planning Association? In fact these are two organizations with similar objectives working for the most part together in an enormous field which is only just beginning to be explored and which includes education for marriage in schools, clubs, and colleges, and helping with marital difficulties. Although Dr. Hellier outlined many of the activities of the M.G.C. in its effort to promote happy stable family life, he mentioned only one of the activities of the F.P.A.—the giving of birth control advice. Is not the main difference between them the clinical approach of the F.P.A. to these problems? At F.P.A. clinics patients are all seen by doctors and advice is given primarily on the medical sexual difficulties in marriage, including birth control. It is, of course, often impossible either for marriage counsellors to help their clients presenting problems without discussing physical relationships or for the F.P.A. doctor to help her patients' frigidity or non-consummation without discussing their personal relationships and their practical difficulties, so that no clear-cut line of demarcation exists.

Thirty years ago, when contraceptive clinics began to be set up, the giving of birth control advice to married couples was an urgent problem which required tremendous courage to tackle and the association was called "The National Birth Control Association." Changing its name in 1939 to "The Family Planning Association" was an expression of the realization of the possible work in the field of subfertility and marital problems. Since then, driven by the requests of their patients, many F.P.A. doctors have found in the clinics opportunities for preventive medicine in the whole field of marital and fertility problems and the whole conception of the work is widening to include this. There are already several marriage welfare centres which offer, in addition to birth-control advice, help for the infertile couple, for those with physical problems in their marriage, male-problem clinics, opportunities for discussion in the realm of sex education and education for family life. At headquarters there is a unit for the investigation of male fertility and laboratories for seminological testing, for Hogben pregnancy test, and for the regular testing of contraceptives on the market for efficiency and clinical harmlessness. The training of doctors and nurses in contraceptive techniques is undertaken in 47 training centres throughout the country and the training and orientation of not only F.P.A. doctors but medical students and postgraduates in dealing with fertility and marital problems is now a rapidly expending part of the work. Many overseas medical visitors find there a bureau for the dissemination of information as well as facilities for training to deal with these problems in their own countries—e.g., last month there were visitors from 28 overseas countries.—I am, etc.,

ELEANOR MEARS,
Medical Secretary,
Family Planning Association.

London, S.W.1.

Penicillin in Scarlet Fever

SIR,—I much enjoyed the article (*Journal*, May 30, p. 1382) by Drs. Elli Jansson and Erkki Klemola on scarlet fever—a disease which is neglected nowadays because of its mildness. I would agree with Drs. T. H. Kirk and J. S. Robertson (*Journal*, August 1, p. 122) for the most part, but in all fairness I would also point out that well over half of the Finnish cases occurred before 1951.

I was surprised, however, at two omissions in their paper: (1) no swab results were detailed, and (2) no oral penicillin seems to have been used. A positive throat swab is strong confirmatory evidence that a given case is streptococcal. The amount of growth, too, may act as a guide, however imperfect, of the number of organisms present and to the results of treatment. Inadequate penicillin may fail to clear the throat of organisms, but a second course rarely fails to do so.

I would agree with Dr. Victor Bincer (*Journal*, August 1, p. 122) that very mild cases do not need any treatment, but I have never found any penicillin-resistant strains. As I hinted above, any "resistance" is probably due to inadequate treatment, especially when the drug is given by injection. If the infections be mild, then one injection may suffice, but at least 3 to 4 may be necessary. Not that I use injections now myself. My routine is to give benzathine penicillin 300,000 units to 600,000 units 6-hourly by mouth, depending on age, the lower dose below 3 years, for 3 days or at the most 5

days. Phenoxymethyl penicillin 250 mg. 6-hourly may be used instead. With this regime most cases are cleared of organisms. If not, then I substitute a course of injections 6-hourly for 48 hours or so. Secondary attacks have been very rare in my experience.—I am, etc.,

Chadwell Heath Hospital, Romford, Essex. I. M. LIBRACH.

Acroparaesthesia and the Carpal Tunnel

SIR,—Mr. Geoffrey Osborne in his letter (*Journal*, July 25, p. 98) shows how venous stagnation and tissue congestion may affect the median nerve in the carpal tunnel. I think the following unusual case of acroparaesthesia in a young man illustrates this very well.

An industrial chemist, aged 28, complained of pain, pins-and-needles, and numbness in the thumb, fore, and middle-finger of the right hand for ten days; there was also some similar discomfort in the medial side of the forearm. The patient had noted that the discomfort was relieved at night, but recurred about two hours after getting up in the morning. Examination showed an arthrodesis of the right wrist due to a septic arthritis in childhood. Application of a sphygmomanometer cuff increased the anaesthesia and paraesthesiae, but on release these cleared completely while he was lying down. Further inquiry revealed that, owing to the stiff wrist and an old fracture of the right clavicle, he did not bother to use this arm at all at work. The symptoms had begun during the first week of hot summer weather, and the paradoxical occurrence of his acroparaesthesiae by day was explained by his arm hanging down unused, while he worked in the heat with the other hand. Encouraged to use the right hand, he also took up badminton and in two weeks he was cured. He has remained free of acroparaesthesia during the ensuing summer months.—I am, etc.,

Liverpool, 1. J. E. FORSTER.

Defining Hypertension

SIR,—Your annotation (*Journal*, August 15, p. 182) states, in connexion with the work of the W.H.O.'s expert committee, that "in defining hypertension difficulties are inevitable." So far I am in full agreement with you, but I must dissent from your description of their decision to adopt a B.P. reading of 160/95 as a criterion as being "reasonable."

The blood pressure rises with cardiac output among other factors, and Dr. Paul Wood,[1] in his well-known work, states that, given a cardiac output of 12 litres a minute, a B.P. of 300/150 would be within the limits of normal. Dr. William Evans[2] has also drawn forcible attention to the dangers of using the sphygmomanometer as the sole instrument in the diagnosis of hypertension. The blood pressure is almost as labile as the pulse and the B.M.R., and in my opinion a true reading can only be obtained under truly basal conditions. I have grave doubts whether the W.H.O. committee will achieve this by "excluding extraneous stimuli as far as possible during the examination."

This is not only an academic problem. In my experience "high blood pressure" has replaced "a heart murmur" as a major cause of iatrogenically induced cardiovascular invalidism. I fear that the somewhat summary criterion adopted by so august a body as a W.H.O. expert committee can only aggravate this deplorable situation. Surely for them, as well as the rest of us, *primum non nocere*.—I am, etc.,

Andover. R. E. MACKIE.

REFERENCES

[1] Wood, P., *Diseases of the Heart and Circulation*, 1956, 2nd ed., p. 761. Eyre and Spottiswoode, London.
[2] Evans, W., *Lancet*, 1957, **2**, 55.

Hypertension after Toxaemia

SIR,—The paper by Mr. George B. Gibson and Sir Robert Platt in your issue of August 15 (p. 159) deals with three series of blood pressure records: (1) A series of initial blood pressures during the first half of pregnancy in women who developed pre-eclampsia. (2) The "London" series of blood pressures from 1,200 unselected females of varying age. (3) A follow-up series of pressures on the same women as in series 1.

The comparison made between series 2 and 3 shows that the mean blood pressure in later years of a group of women who have suffered from "pre-eclampsia" is higher than that of all women of the same age. To put it less precisely, the group includes a proportion of women with "hypertension."

But the comparison between these two series of blood pressures of non-pregnant women and the initial blood pressures of a group of women during pregnancy is open to the serious objections which are set out by the authors, and then circumvented by them. Although these initial pressures are incorrectly labelled "before . . . a toxaemic pregnancy" in two legends, and referred to as "toxaemic series in early pregnancy," they cover the first half of pregnancy, right up to the twenty-first week. They *must*, therefore, be affected by the physiological fall in blood pressures during pregnancy.

It is argued against this that no difference was found between these pressures (two-thirds) recorded between the fourteenth and twentieth weeks, and those (one-third) recorded shortly before the fourteenth week. Surely this is clear evidence that the fall in blood pressure occurs so early that all these readings are affected. Or do the authors suggest that the physiological fall is not at all apparent before the twenty-first week?

The analysis presented in this paper shows that, below age 40, the distribution of blood pressures among these women in the first half of pregnancy, although reduced by the effect of the physiological fall and although further lowered by the exclusion of all pressures over 140/90, nevertheless conforms remarkably with the London series of unselected non-pregnant women. Is it therefore to be concluded that these readings in the first half of pregnancy are "reliable," or rather clearly inferred that the mean blood pressure of these women *before* their pre-eclamptic pregnancies was higher than the mean for their age? It would follow that the rise of blood pressure observed during years of follow-up is by no means so striking, and does not justify any causal association with the pregnancy toxaemia. It might even be merely parallel to the mean rise with advancing years.—I am, etc.,

Eastern General Hospital, Edinburgh, 6. P. R. MYERSCOUGH.

SIR,—The paper by Mr. G. B. Gibson and Sir Robert Platt on the incidence of hypertension after pregnancy toxaemia (*Journal*, August 15, p. 159) is based on a premise that is largely unacceptable, for they regard a blood pressure of 140/90 as dividing toxaemic from normal pregnancy. This figure is altogether too high. The pressure they mention is of critical value only in

the therapeutics of the syndrome, but toxaemia is already present before this level has been reached. Browne[1] had early stressed that a pressure of 120/80 should form the dividing line, an experience that, with many others, I endorse. A great many pregnant women with pressure above this level have been excluded from the consideration of these authors as suffering from pre-eclampsia, and the effect of their exclusion vitiates the conclusions drawn from the data presented.

The problem of the understanding of toxaemia is lamentably confused by a failure of agreement on the criteria of its present and by a lack of appreciation—at least by the obstetrician—of recent advances in the knowledge of the physiology of the kidney. A symposium on the subject is long overdue.—I am, etc.,

London, W.1. JOHN SOPHIAN.

REFERENCE

[1] Browne, F. J., *Antenatal and Postnatal Care*, 1946, 6th ed., p. 384.

Transplantation of Foetal Tissues

SIR,—Referring to the disclaimer by Dr. H. E. M. Kay and Dr. M. Constandoulakis concerning my report on foetal transplants, the reason I did not consult them was that I had never heard of either of them.

The basic information in the report was volunteered to me in person by one of their distinguished colleagues—a fact which I told them before they submitted their letter to you but which they preferred to ignore when writing it.

I was responsible for pointing out that their work resembled that being carried out by Dr. Niehans, but again the statement that one of the British workers in this field had visited Niehans was also given to me by the colleague concerned.—I am, etc.,

London, E.C.4. CHAPMAN PINCHER.

Cet animal est méchant

SIR,—In this annotation (*Journal*, August 29, p. 294) you deplore the inaccurate criticisms of our National Health Service which have appeared in a publication of the American Medical Association, and you reasonably suggest that a report by British doctors on the disadvantages of the American medical system may be long overdue.

On the other hand, we could study for our own benefit the thought and experiment on medical work which has been going on very actively in the United States. The extent of this can be seen in a large book, *Readings on Medical Care*, published in this country by the Oxford University Press. Since 1939 we have found no time in this country to modernize the organization of medical work, and it has become fossilized in an incomplete form with too much segregation of doctors in ever-widening divisions. I hope that you will transmit to us some of the study which has been made on this subject in the United States, and that the Porritt Committee of the Association will give it their consideration.—I am, etc.,

London, W.1. J. M. ALSTON.

Filling the Gap

SIR,—The medical staff committee of this hospital recently approached the medical schools in this country in an attempt to find out how many medical students would be expected to qualify this year, and how many posts would be available within the teaching hospitals for those who passed the necessary examinations. Ten teaching hospitals were kind enough to reply, and on analysing their answers we learn that 705 medical students were expected to qualify, and for these successful candidates 658 posts were available for them in their respective teaching hospitals.

Information also has been obtained from the General Medical Council about the number of overseas doctors temporarily registered each year in this country, and it would seem that approximately 500 doctors are thus registered. It is obvious from these figures that the junior hospital posts in provincial hospitals—were it not for the 500 overseas doctors—cannot be filled.

We feel that this information should be published in the medical press.—We are, etc.,

N. K. B. KIMBELL,
Chairman.
H. J. RICHARDSON,
Hon. Secretary,
Medical Staff Committee.

Stamford and Rutland Hospital.

Non-clinical Teachers for S.E. Asia

SIR,—The Commonwealth Relations Office (C.R.O.) not infrequently receives requests from countries in S.E. Asia for the loan of professors of non-clinical subjects for their universities and medical colleges under the Technical Co-operation Scheme of the Colombo Plan. Delays frequently result while universities and other interested bodies are circularized.

Readers or lecturers on temporary secondment are preferred, but recently retired professors or lecturers in anatomy, physiology, pharmacology, pathology, bacteriology, and biochemistry are also acceptable in most cases.

For the sake of ready reference the C.R.O. is making a list of suitably qualified persons who would consider offers of such work on favourable terms. I should be glad if anyone interested in spending up to two years abroad in strengthening the bonds of the Commonwealth and in teaching their own subject would communicate with me at the Commonwealth Relations Office, Matthew Parker Street, London, S.W.1.—I am, etc.,

GEORGE R. MCROBERT,
Medical Adviser to the
Secretary of State for Commonwealth Relations.

London, S.W.1.

Printing the "B.M.J."

SIR,—I would like to congratulate and thank you for the way you have continued the publication of the *British Medical Journal* in the face of numerous obstacles.

I think I speak for many hundreds of British doctors abroad when I say that the *B.M.J.* is one of our main links with home and modern developments in medicine. The few "fellow travellers" in our profession who condemned your action should be reminded that medicine should know no geographical or political boundaries. Only the health of the people, regardless of race, colour, religion, or politics, should matter. You have upheld this principle and deserve our thanks.

In some countries, government action would be taken against printers refusing to produce essential publications. This, surely, is far worse than the action you have taken in employing printers who, by exercising their freedom, have elected to remain independent.—I am, etc.,

Moscow. J. FURLONG.

Obituary

Sir FRANCIS TEALE, K.C.V.O., M.D., F.R.C.P.

Sir Francis Teale, formerly lecturer in bacteriology and immunotherapy in the University College Hospital Medical School, and honorary officer in charge of the immunotherapy department of the hospital, died on August 22. He was 84 years of age.

Sir ROY CAMERON, F.R.S., writes: Francis Hugo Thiele (he changed his name to Teale) was born in Paddington in 1875, the son of a successful business man of German origin. He was educated at University College, London, and at its medical school, taking his B.Sc. in 1895, his M.B. in 1897, and M.D. in 1898. Teale was a brilliant, hard-working student who achieved honours in medicine and forensic medicine, with many hospital medals. After several *Wanderjähre* in Germany, where he spent some time learning immunological techniques at Frankfort on Main from Ehrlich, and in the medical clinics at Berlin, he settled down in London as assistant pathologist to University College Hospital in 1901. Subsequently, with the expansion and stabilization of the medical school, his interests concentrated more upon chemical and clinical pathology, and in 1907 we find him lecturing on these subjects, as well as conducting necropsies at the hospital. In 1908 this versatile man gave lectures in bacteriology and tropical pathology for the various diplomas in public health. He held the post of official lecturer in bacteriology from 1910 until 1935, and officer in charge of the inoculation department until 1938.

Teale steadily built up an enviable reputation as a teacher, and many generations of U.C.H. students have good reason to remember the M.B. revision classes that he and his close friend, the late Dennis Embleton, ran with characteristic cynicism and humour. In his latter years he gave himself up almost wholly to private practice in clinical pathology, though for long he acted as honorary bacteriologist to the Radium Beam Research Institute and honorary pathologist to the Nelson Hospital.

Teale's early contributions to research covered such diverse topics as the antitryptic activity of the blood, pyrogens, the Wassermann reaction, and active and passive hypersensitivity to the tubercle bacillus. With E. Bach and Dennis Embleton he explored the manifestations of pathogenicity and virulence of bacteria against a background of host resistance: tetanus toxin was tracked along the nerves to the spinal cord; tetanus antitoxin was shown to pin down circulating toxin at the seat of its production so that it could not reach the central nervous system. The fate of spores in the tissues, the anaphylactic reaction as it looms up during bacterial infections, and the evolution of antibody were in turn investigated with profit. Teale was well aware of the role of the reticulo-endothelial system in clearing the blood of bacteria and foreign protein long before most investigators had realized the importance of Aschoff's inspired generalization. Perhaps his finest contribution was a paper in 1934 on the portal of entry of bacteria into the animal, which still makes good reading. The papers with Embleton on ascending infection of the urinary passages were, however, criticized rather severely because of technical imperfections.

Teale's assistants included H. G. Butterfield, V. R. Khanolkar, Cuthbert Dukes, and Geraldine Le Bas (Lady McNee), all of whom achieved eminence in their profession. Long after his retirement from University College Hospital he continued his researches into the spread of anthrax and the cellular defences of the body, assisted by his devoted and untiring senior technician, Mr. C. Oliver. Throughout his life he collected information about haemophilia.

To those who knew him in his years of maturity Teale appeared to be no more than a self-assured, dapper little man with a disarming smile. But he was much more than that. His comments were shrewd and worldly-wise, punctuated with rare outbursts of deadly cynicism. His judgment was cool and seldom went astray, although he could infuriate the listener by wandering off into irrelevancies. He read widely and with discernment, and was devoted to the philosophy of Spinoza.

Various honours came his way. He was elected a Fellow of the Royal College of Physicians in 1913, gave its Dobell lecture in 1918, and the much-prized Sydney Ringer lecture at University College Hospital Medical School in 1919. His Fellowship of University College, held since 1913, was a highly treasured possession. He was appointed a Commander of the Royal Victorian Order in 1944, and was promoted a Knight of that Order in 1951. He was also a Chevalier, first-class, of the Royal Order of St. Olaf. His marriage with Dorothea, daughter of Philip Felsen, Esq., brought him great happiness.

E. J. NEILL, M.B., B.Chir., M.R.C.S., L.R.C.P.

Dr. E. J. Neill, who was a general practitioner in Newhaven, died on August 11, aged 55.

Eric James Neill was one of four sons of two doctors, the Rev. Dr. Charles Neill and Dr. Margaret Neill (née Munro). His father and uncle, Balfour Neill, were Caius and Bart's men, but his father—having qualified—left medicine, and Eric grew up in the atmosphere of parish work among working people. He stayed happiest in this throughout his life, so that when his old chief, Wilfred Shaw, told him later how much better he could have done in a London practice, he said, "You know, I grew up in a parish, and these working people are what I want." His education was at Dean Close School and then, when his father moved, at St. Paul's, from which he won a classical scholarship to Caius. He played in the university hockey trials and took an honours degree in classics, but, realizing that schoolmastering was not his life, he went to his father's hospital to study medicine. There he qualified quickly (in 1929), played hockey for Bart's and the United Hospitals, worked as a resident under Wilfred Shaw, and met his wife. After a short time in Ipswich with her he settled in Newhaven and there worked for 28 years, interrupted only by war and illness.

At the time of the Munich crisis he volunteered for the R.N.V.R. and in 1939 was called up. For the greater part of six years he was at sea with the Fleet Air Arm. To his sensitive nature this was a painful service, long close contact making it harder to bear the inevitable end of many of his airmen. He was never so fully fit afterwards, but stuck closely to his beloved practice, even to the extent of shortening treatment of a disk lesion by almost compelling his neurosurgeon to do a laminectomy. He worked arduously, for, with his busy practice, he was also Admiralty surgeon and agent and Treasury medical officer, and it was his duty to meet cross-Channel boats.

He served on divisional B.M.A. and other committees and used his great knowledge of local conditions and people forcefully on the urban district council. Indeed, he disliked leaving Newhaven, and so confined his recreations to tennis and captaincy of the town hockey side. His only outside appointment was his London masonic lodge, and he occupied its chair. He loved caravanning holidays and, most of all, his home. Here, with his wife—who shared his life very fully—he was always waiting to help his people, and his father's ideals were strong in him. Very few have so warm or determined hearts. He brought the resources of British public-school life, Cambridge, and Bart's voluntarily to his devoted working people, with no show at all. Deepest sympathy goes to his widow and son. His practice is taken over by his companion in war and partner in peacetime years since, Dr. Ralph Alexander.—W. A. B.

LILIAN A. EASTWOOD, M.B., Ch.B.

Dr. Lilian Eastwood, well known for her work for the British Red Cross Society, died on August 9 in the Royal Surrey County Hospital, Guildford. She was 67.

Lilian Annie Eastwood (*née* Clark) was born on October 24, 1891. She was a medical student at the London School of Medicine for Women and graduated M.B., B.S. in 1915. After working as casualty house-surgeon and house-physician at the Queen's Hospital for Children, Hackney Road, she became medical officer at a munitions factory in Hereford. Thereafter she served for a time in the mission field in India, being on the staff of the Cama Hospital in Bombay.

When she came to Surrey she settled in East Horsley, where she was a regular attender at the meetings of the Guildford Division of the B.M.A., and served on both the executive and ethical committees of the Division.

In recent years, however, it will be for her untiring and enthusiastic work for the British Red Cross Society that Dr. Eastwood will be known to so many people in this country. She was author of the *Catechism for First Aid* published by the Society, and since the opening in 1947 of the National Training Centre of the B.R.C.S., at Barnett Hill, near Guildford, she had regularly conducted there certificated courses in first aid. Many members of the Society are indebted to her for her advice and encouragement, which were always so willingly given. She was greatly interested in the modern technique of casualty simulation and quickly realized its value in practical first-aid training. She had a wide circle of friends in Surrey, where she had held the appointment of divisional medical officer for the Guildford rural division over a number of years. She was still holding this appointment at the time of her death. The Surrey Red Cross will miss Dr. Lilian Eastwood badly and so will the Guildford Division of the B.M.A.

ALICE E. S. CLOW, B.Sc., M.D.

Dr. Alice Clow (née Sanderson), for many years medical officer to Cheltenham Ladies' College, died in Cheltenham on July 28, aged 84.

Alice Emilie Sanderson, who was born on May 14, 1875, was the eighth child of 11 brothers and sisters and had a very happy childhood. After graduating B.Sc. at Bedford College and teaching for a short time she entered the Royal Free Hospital medical school in 1905, graduating M.B., B.S. in 1908, and proceeding M.D. six years later. After qualification she held several resident appointments, including house-physician at her own hospital. In 1912 she joined Dr. Mary Cargill in Cheltenham, and there she remained for the rest of her life.

L. M. J. writes: Dr. Alice Clow's outlook had always been critically scientific and direct, but her touch was both humane and perceptive. As medical officer to Cheltenham Ladies' College she collected over many years important statistics on the hygiene of menstruation which have been recognized by European as well as English authorities as influencing modern views on its physiology. Her pamphlet for schoolgirls on this subject is still in use. She also worked for the Medical Women's Federation on research on the menopause. A loyal member of the B.M.A., she became an honorary member of the Medical Officers of Schools Association. During the first world war she joined the Medical Women's unit attached to the R.A.M.C., and saw service in Malta and Salonika. There she met Dr. David Clow, whom she married after resuming practice in Cheltenham alongside her husband's. The marriage was extremely happy and was enriched by the adoption of two daughters. In 1938 the Clows retired to a house at Charlton Kings, Cheltenham, but David Clow continued to practise until after the second world war. He died in 1957.

In thinking over Dr. Alice Clow's life one realizes that no one less pretentious ever lived. Her gifts of clear thought and sound sense, her perception of character, and her generous admiration and affection for her friends were concealed by her gentle, quiet manner and very genuine humility. She died peacefully at home after some years of gradually failing sight and strength, patiently borne. Though she became unable to play duets on the piano with her daughter, she continued to enjoy classical music on the wireless, and she kept in touch with the lives around her through "the news" and through the "talking books" now so mercifully available to the blind. She was cared for and nursed devotedly by her elder daughter, and the younger left her family to be with her at the end. It is to them our sympathy goes out. Alice herself was more than ready to join her husband.

N. E. SAMPEY, L.R.C.P.&S.I.

Dr. N. E. Sampey, one of East Ham's medical personalities of an earlier generation, died recently in his 78th year.

Norman Edgar Sampey was born in County Roscommon on December 17, 1881, and received his medical training in Dublin, qualifying in 1905. He came to England soon afterwards and established himself in practice in East Ham in 1910.

S. T. writes: There is no doubt that Dr. Sampey's rapid success was due in no small measure to the ability and enterprise of his life's partner, for Mrs. Sampey, like her husband, throughout the years entered into the social life of our community. Norman Sampey saw enormous changes in his branch of the profession. There are those who remember him in his early days doing his rounds on a bicycle, in frock-coat and silk hat, which mode of progress, however, he changed as soon as a growing practice made possible, for he became known as a pioneer and most enthusiastic motorist. His practice was well established when the 1911 National Insurance Act was introduced, and, although he was originally much opposed to it, once it was in being he became a most effective member who worked assiduously in its cause, and was a member of the insurance committee from 1921.

A sound clinician who kept up a high standard of practice, Dr. Sampey was a tremendous worker. Fifty visits a day were well within his compass, and our generation may well reflect that in his early years he followed the custom of long morning and evening surgeries seven days a week. We can remember, too, with gratitude that he pioneered the rota system, which originally for many years was one week-day afternoon only. Those associated with the St. John Ambulance Association will remember the enthusiasm of Dr. and Mrs. Sampey for this work. Dr. Sampey retired from general practice in 1933 and was appointed the medical officer to the Beckton gas works, where he rendered excellent service during the grim period of the second world war. It was not, however, his first experience of enemy action, for he joined the R.A.M.C. in 1914 and served in Mesopotamia—actually, to his great joy, under the command of his brother, Colonel A. W. Sampey, who was well known in his day in the Indian Medical Service.

In spite of his professional commitments, Dr. Sampey was a most versatile man. He enjoyed his music, and his prowess with a gun in the field of sport was well above average. All his friends knew him as a first-class companion, whose hospitality and wit will long be remembered. His later years were clouded with illness which came soon after the death of his wife, a loss which he never really overcame. A few years ago he retired to his beloved Ireland, so that he could end his days in that homeland where he invariably took his annual holiday. It may well be said that he is entitled to be remembered as one who served his patients and his profession with zeal and ability. He is survived by his only son, Dr. Alec Sampey.

A memorial service for Sir Robert Arthur Young will be held at the Royal Parish Church of St. Martin-in-the-Fields on Monday, September 7, at 12 noon.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on July 11 the following degrees were conferred:

D.M.—D. F. van Zwanenberg.

B.M.—A. M. S. Sherrington, N. C. Keddie, J. N. Fergus, H. J. G. Kersey, R. Porter, M. R. Lee, A. C. Branfoot, R. Dee, R. P. Ellis, A. R. M. Freeman, G. W. Thomson, Jacqueline, R. P. White, Judith H. Mundlak, Gillian R. Ford, *J. C. O'Sullivan, *A. M. Bold, *H. D. Weintraub, *C. A. Fuge, *M. G. M. Jukes.

*In absence.

Dr. Walter John Cliff has been elected to the Philip Walker Studentship for 1959–60.

In Congregation on June 25 the degree of D.M. was conferred on C. W. H. Havard.

The Radcliffe Scholarship in Pharmacology has been awarded to K. M. Waddell (Merton College).

In Congregation on June 16 Dr. W. F. Watkins was appointed a University Demonstrator in Bacteriology from October 1, 1959, to September 30, 1964.

Dr. A. H. T. Robb-Smith has been appointed a Curator of the Botanic Garden for six years from the first day of Michaelmas Term, 1959.

On June 4 Sir George W. Pickering, Regius Professor of Medicine in the University, was elected a Curator of the Botanic Garden and Sir Hans Krebs, F.R.S., and Dame Janet Vaughan were elected members of the Hebdomadal Council, all from the first day of Michaelmas Term, 1959, for six years.

In Congregation on June 6 the degree of D.M. was conferred on S. F. Taylor and Jean Binsburg.

In Congregation on August 1 the degree of D.M. was conferred on Brian McConkey.

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examinations indicated:

FINAL M.B.—*Part II:* [1 2 3]G. F. Abercrombie, [1 2 3]A. H. Abrahams, [1 2 3]J. D. Allison, [1 2]C. L. C. Arnold, [2]N. A. Atalla, [1 2 3]D. S. Bamford, [1 2 3]N. C. Barber, [1 2 3]M. C. Bartlett, [1 2]N. J. Barton, [1 2 3]P. J. F. Baskett, [2]P. F. Bates, [1 2 3]R. J. M. Bell, [1 2 3]A. J. Black, [1 2]J. P. Blackburn, [1 2 3]P. L. Boardman, [1 2 3]A. E. Booth, [1 2]K. R. Bowles, [1 2 3]M. A. Branthwaite, [2]J. R. Bright, [1 2 3]A. D. M. Bryceson, [2]E. G. Cantrell, [1 2]A. F. S. Childs, [1 2 3]I. G. Chisholm, [2]R. B. Church, [1 2]D. R. F. Clark, [1 2 3]D. F. Cort, [1 2 3]A. J. Costello, [1 2 3]P. M. B. Crookes, [1 2 3]J. M. Dawson, [1 2 3]D. Denis-Smith, [1 2 3]D. H. Dick, [1 2 3]N. Dobie, [1 2 3]R. J. Donovan, [1 2]J. B. Douglas, [1 2 3]P. Drinkwater, [1 2 3]T. B. Duff, [1 2 3]J. A. Dyde, [1 2 3]B. B. Edoo, [1 2 3]J. A. T. Ellis, [1 2]G. H. Evans, [2]V. C. Faber, [2]J. Farmer, [1 2 3]G. Farrer-Brown, [1 2 3]P. Fells, [1 2]E. W. L. Fletcher, [2]C. du V. Florey, [1 2]D. M. C. Forster, [1 2 3]R. W. Gabriel, [1 2]F. R. Gamman, [1 2]N. F. C. Gane, [1 2]S. L. Geoghegan, [1 2]D. Godwin, [1 2]J. Gough, [1 2 3]P. J. Graham, [1 2 3]B. E. C. Hale, [1 2 3]C. M. Hales, [1 2 3]K. M. Hambidge, [1 2 3]R. W. McK. Hamilton, [2 3]S. G. I. Hamilton, [1]S. Harcourt-Webster, [2 3]A. Harley, [1 2 3]J. R. Harrison, [2]M. T. Haslam, [1 2 3]R. B. Hedworth-Whitty, [1 2]J. M. Henk, [1 2 3]B. Higgs, [1 2]P. Hill, [3]Mrs. P. M. Hill, [1 2 3]G. H. Hillam, [1 2 3]T. C. Hindson, [1 2 3]N. J. B. Hitchcock, [2 3]G. A. Hobbs, [1]G. R. Hobday, [1 2 3]J. D. Hobday, [1 2 3]P. N. Holberton, [1 2 3]D. A. Hopkinson, [1 2 3]P. J. N. Howorth, [1 2 3]C. J. Hunter-Craig, [1 2 3]R. F. Hurding, [2]T. A. Hussell, [1 2]S. M. N. Jaikaran, [1 2 3]Mrs. B. J. James, [1 2 3]J. P. James, [1 2 3]A. J. W. Jarvis, [1 2 3]G. H. C. Jenkins, [1 2 3]D. L. Jennings, [1 2 3]C. J. A. Jephcott, [2]E. V. Jones, [1 2 3]D. H. Keeling, [1 2 3]R. E. Kendell, [1 2 3]J. E. R. Lart, [1 2 3]E. A. Lazarus, [1]B. K. Lee, [1 2 3]N. E. F. Lever, [1 2 3]R. A. Lewin, [1 2 3]D. M. Lewis, [1 2 3]P. S. Lewis, [1 2 3]B. A. Lockley, [1 2 3]Y. W. Loke, [1 2 3]R. Lomax, [1 2]P. W. Lord, [1 2 3]J. M. Lunn, [1 2 3]A. W. McKenzie, [1 2]J. E. D. McLaren, [1 2 3]E. C. Marcus, [1 2]D. M. Marsh, [1 2 3]R. Marsh, [1 2 3]B. Martin, [1 2 3]J. S. Mather, [1 2]N. J. Maurice-Smith, [1 2 3]B. S. Meldrum, [1 2 3]C. S. Menzies-Kitchen, [1 2 3]M. A. Message, [1 2 3]J. W. Miller, [1 2 3]M. C. Mitcheson, [1 2]R. H. Morgan, [2]I. S. Muir, [2]D. N. E. Myers, [1 2 3]R. M. Negus, [1]A. J. H. Nix, [1 2 3]G. F. Norris, [2]M. J. Orrell, [1 2 3]J. D. Parkes, [1 2 3]M. J. Peckham, [1]Mrs. M. E. Peppercorn, [1 2 3]B. A. W. Perkins, [1 2 3]L. L. W. Peters, [2]J. Pilcher, [1 2 3]I. C. Pitter, [1 2 3]C. R. M. Prentice, [1 2 3]H. M. Rawlinson, [1 2 3]M. Rendall, [1 2 3]M. H. Retter, [1 2]D. A. Richards, [1 2]E. H. Richards, [1]J. W. S. Rickett, [1 2]J. R. L. Roberts, [1 2 3]H. M. Sargent, [1 2 3]J. A. Savin, [1 2 3]R. H. Secker Walker, [1 2]A. P. Sherman, [1 2 3]C. L. Smailes, [2]I. S. Smith, [1 2 3]P. Snell, [1 2 3]D. P. Stables, [1 2 3]J. M. S. Standley, [1 2 3]R. B. Stenhouse, [1 2 3]F. A. Strang, [2]N. J. Strickland, [1 2 3]P. J. Swinglehurst, [2]P. H. Tatham, [1 2 3]R. T. Taylor, [1 2 3]T. C. Taylor, [1 2]M. Thomas, [2]P. G. R. Tingley, [2]J. S. H. Tooth, [1 2 3]M. R. Turner, [1 2 3]I. W. Wallace, [1 2 3]E. N. Wardle, [1 2 3]F. Warwick, [1 2 3]D. F. L. Watkin, [1 2 3]J. N. Webb, [1 2 3]M. R. H. Webb, [1 2]J. S. Wigglesworth, [3]G. Willett, [1 2 3]P. Williams, [1 2 3]C. J. F. L. Williamson, [1 2]M. St. G. Wilson, [1 2]G. H. E. Woodbine, [1 2 3]D. A. Wright, [1 2 3]A. J. Yates-Bell, [1 2 3]J. M. Yong. *Part I (Pathology and Pharmacology):* C. L. C. Arnold, N. A. Atalla, A. J. C. Balfour, M. C. Bartlett, N. J. Barton, A. J. Black, F. M. Boston, R. B. Church, P. M. B. Crookes, J. M. Dawson, R. S. W Dowling, B. B. Edoo, G. Farrer-Brown, R. W. Gabriel, N. F. C. Gane, K. M. Hambidge, T. S. Hattersley, P. Hill, G. R. Hobday, D. A. Hopkinson, P. B. Jacobs, R. S. Kirk, D. M. Lewis, J. S. Macve, J. G. Manson, Mrs. M. E. Peppercorn, L. L. W. Peters, R. I. R. Sinton, R. B. Stenhouse, N. J. Strickland, R. E. Tattersall T. C. Taylor, P. G. R. Tingley, J. N. Webb, M. St. G. Wilson.

[1]Passed in principles and practice of physic. [2]Passed in principles and practice of surgery. [3]Passed in principles of midwifery and gynaecology.

Dr. R. W. Ross Russell has been elected into the E. G. Fearnsides Scholarship for 1959.

Dr. G. R. Hervey has been approved for the degree of Ph.D. for a dissertation on the effects of obesity-producing hypothalamic lesions in rats joined in parabiosis.

Dr. C. R. Leeson has been approved (in absence) for the degree of M.D. for a dissertation on the histological, histochemical, and electron microscopic studies on the rat submaxillary gland, with special reference to the post-natal development.

In Congregation on August 1 the following degrees were conferred:

M.D.—C. Rashbass, J. R. Rees, R. H. B. Mills.

M.CHIR.—K. P. Abel.

M.B., B.CHIR.—J. M. Dawson, *I. S. Muir, F. Warwick, *R. M. Negus, S. O. Wamuo.

M.B.—*P. B. Jacobs, *Yung Wai Loke, A. E. Booth, C. J. Hunter-Craig, P. S. Lewis, P. Fells, *J. G. Manson, *A. J. Yates-Bell, *D. F. Cort, D. Denis-Smith, *R. Marsh, R. S. Hickling, M. A. Message, B. S. Meldrum, D. S. Bamford, *Margaret A. Branthwaite, *Elizabeth C. Marcus, *Margaret H. Retter, Mary R. H. Webb.

*By proxy.

UNIVERSITY OF ABERDEEN

At graduation ceremonies held on July 9 and 10 the following degrees and diploma were conferred:

M.D.—[1]I. A. Cook, I. McI. Duguid, J. S. Finnie, R. R. Mowatt, I. G. Thomson.

M.B., CH.B.—[1]W. D. Mackay, [2]W. R. Greig, [2]Anne Lundsgaard, [2]A. S. Mackenzie, [2]R. A. Yuill, T. K. Agble, I. W. W. Anderson, E. R. Asiedu, Rita M. Baillie, Gabrielle A. M. Baird, Sylvia T. Ballard, Alison F. H. Birnie, A. J. Buchan, Betsy M. A. A. Cavallo (née Davis), J. H. Chinnock, G. I. Cohen, Joan M. R. Colt, C. McK. Corser, H. R. Crofts, A. I., Davidson, A. M. Duthie, J. A. Duthie, A. J. D. Farquharson, D. Femi-Pearse, J. A. M. Findlay, G. Foubister, W. C. Gordon, Elizabeth S. Harper, J. L. Hay, A. S. Henderson, J. W. Hunter, Anne Lejeune, D. Lipp, Elizabeth Luke (née Flanagan), W. Macdonald, I. A. Macfarquhar, D. R. Mackay, H. McPherson, I. Matthewson, Audrey M. Morgan, G. D. Morrice, W. J. Morrison, Leonora J. H. Murray, R. M. Preshaw, Winifred Proudfoot, J. Reid, C. M. T. Robb, D. A. Robertson, J. G. Robertson, J. W. Robertson, G. Russell, E. L. Smith, Anne E. Staddon, Joan Stephenson, G. MacL. Stewart, Beryl M. Stone, A. B. Thain, Irene A. Watson, D. Wiseman, Audrey W. Young.

DIPLOMA IN PUBLIC HEALTH.—B. G. Farrell.

[1]With honours. [2]With commendation.

The following University prizes and medals were awarded during the 1958–9 session: *Anderson Gold Medal and Prize in Clinical Medicine,* Anne Lundsgaard; *proxime accessit,* W. R. Greig. *Alexander Smith Cardno Prize in Anatomy* and *Silberg Prize in Anatomy,* N. B. Bennett. *Chanock Gold Medal in Anatomy, Fife Jamieson Gold Medal in Anatomy, John G. McWillie Prize in Physiology and Biochemistry,* and *Durno Prize in Anatomy,* R. S. Chapman. *Dyce Davidson Memorial Gold Medal in Materia Medica,* A. Bruce. *Matthews Duncan Gold Medal in Obstetrics* and *Davidson Smith Prize in Diseases of Children,* Anne Lundsgaard. *Keith Gold Medal in Surgery,* W. D. Mackay; *proxime accessit,* R. M. Preshaw. *Lizars Gold Medal in Anatomy,* W. G. Skene. *MacQuibban Prize in Medicine,* W. R. Greig. *McQuibban Prize in Surgery,* W. D. Mackay and R. M. Preshaw (equal). *Murray Medal and Scholarship (for the most distinguished graduate in medicine of the session),* W. D. Mackay. *Ogston Prize in Surgery,* Valerie A. Briggs. *Shepherd Memorial Gold Medal in Surgery,* R. M. Preshaw. *Struthers Gold Medal and Prize in Anatomy,* A. G. N. Moore. *John A. Watt Prize in Preventive Medicine,* K. A. Smith.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examinations indicated:

PH.D.—*In the Faculty of Medicine:* D. C. Berry.

FINAL M.B., CH.B.—*Patricia C. Clegg, *P. R. Golding, *Sara J. Harries, *M. S. Knapp, *Sylvia J. Smith, Anne F. M. Bracey, R. M. Carr, A. J. Cooper, J. Cooper, Mollie Dada, J. W. Davies, S. T. De Garis, E. S. Etuk, R. B. Goffin, J. A. A. Hakes, Valerie J. Howard, C. F. Lipscomb, Patricia M. Lovell, J. A. O. Magbagbeola, R. V. Magnus, T. A. Medway, A. G. Nash, O. O. Odutola, C. Panahy, D. W. Pilton, Patricia Stant, H. Steiner, D. W. Sykes, M. O. Symes, M. A. Voyce, D. H. Wale, Anna G. Walker, I. R. Walker, A. G. White, A. M. Wilson. *In Group II only:* M. G. Dash, K. R. Davies, G. Kerr.

*With second-class honours.

The following candidates have been approved at the examinations indicated:

M.D.—G. Hudson, C. D. R. Pengelly, R. J. Sandry.

PH.D.—*In the Faculty of Medicine:* M. J. Manners.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College held on July 30, the President, Sir Robert Platt, was reappointed representative on the governing body of the British Postgraduate Medical Federation and Sir Adolphe Abrahams representative on the Professional Aids Council.

Licences

Licences to practise were conferred upon the following candidates who had passed the final examination in medicine, surgery,

and midwifery of the Conjoint Board and who had complied with the by-laws of the College:

F. R. V. Abraham, A. H. Abrahams, B. K. Adadevoh, P. M. Aichroth, B. S. Ajenifuja, R. T. J. Allen, O. Alozie, L. B. Arkles, S. G. Ashman, M. A. Axelrad, J. A. C. Bailey, R. Baker, D. S. Bamford, M. R. Beck, P. J. R. Bell, D. R. Benady, H. C. Bentley, D. Berzon, E. M. Blenkinsopp, R. P. Bonner-Morgan, I. G. Bronks, A. A. Y. Brouet, B. G. D. Cameron, I. G. Chisholm, Cheng Kim Chua, Avery B. Cooper, C. P. Cooper, I. P. Crawford, H. L. Davies, J. M. Dawrant, J. M. Dawson, J. L. C. Dobson, Hilary E. B. Dudley-Paget, Mary S. Duncan, J. A. Dyde, D. A. Edwards, D. A. Evans, M. A. Farrow, June R. Finer, E. W. L. Fletcher, T. I. Francis, D. Gaan, M. G. S. Golby, M. R. Gooding, N. M. Goodwin, A. M. Gould, E. Gowland, M. F. Grayson, I. P. Griffith, T. S. Hattersley, J. Hedley-White, Brenda E. Higgs, P. Hill, Elizabeth J. Hiller, J. W. Hodson, D. A. Hopkinson, K. N. Hudson, Valentine P. L. Humphreys, B. Igboghahaka, Beatrice J. James, W. A. Johns, Moira B. Kelly, Susan P. Kendall, D. G. Kraft-Goddard, N. G. Lambert, B. H. Latimer, R. A. Lee, D. A. Leigh, K. J. B. Lewin, A. H. Lewis, D. M. Lewis, Gertrude Lowith, A. W. McKenzie, J. J. Maher, M. Mahloudji, W. Manton, Elizabeth C. Marcus, J. L. Martin, Patricia A. Martin-Turner, Susan Y. Mearman, G. L. Mills, R. H. S. Mindham, S. G. Moisey, G. W. Moxon, R. W. Myers, M. J. Nicholls, J. C. Oakley, O. N. Onyeaso, B. L. Orme, T. J. Owen, Janet E. Page, J. C. E. Parkinson, E. N. Pickering, Audrey M. Platt, B. J. Ranscombe, Margaret H. Retter, E. H. Reynolds, P. R. Richards, J. W. S. Rickett, A. H. Roberts, D. W. Ross, C. J. Rowland, G. Sackstein, E. U. Sagay, Phillida A. Sampson, Hazel M. Sargent, D. H. M. Sayner, B. J. Sealey, Yuk Sang Shum, A. E. Slater, J. C. Smith, B. K. Sood, B. J. Stafford, R. Stephenson, K. J. Sugden, N. H. Sutcliffe, S. H. Thompson, D. C. Townsend, P. A. Trott, Barbara W. Truscoe, C. G. Turner, Zarina I. R. Vellani, Margaret V. Ward, Anna Warrander, Mary R. H. Webb, C. W. Weerasuriya, Margaret J. Wharton, Janet A. Williams, W. Williamson, G. S. L. Wilson, R. P. Winstanley, D. A. Wright, Kok Kooi Yong.

Diplomas

The following diplomas were granted jointly with the Royal College of Surgeons of England to the following candidates:

DIPLOMA IN ANAESTHETICS.—Miriam M. Alderwick, J. S. Armstrong, Rachel M. Arnold, M. Austin, W. Bargh, Edith M. Berry, Margaret E. Beveridge, C. H. B. Binns, Doreen M. Birley, G. L. Bradt, Kathleen P. Browne, J. A. A. S. Chamberlain-Webber, Kamla Chandiramani, M. D. Churcher, E. Chyrosz, J. A. Collie, Barbara B. Collier, K. Conway, D. R. Couchman, E. Ff. Darling, R. C. Davie, P. A. Debenham, H. K. Dube, Mary D. Evans, V. Evans, El Tahir Fadl, A. G. Farah Salieh, D. J. M. Ferguson, B. Foster, D. L. French, G. Futers, H. J. Galvin, B. S. Gharpure, D. A. Gilchrist, R. C. Giles, T. Gnanaanantham, P. J. Gregory, K. B. Guy, Elisabeth D. Hahn, Rosemary C. Hayball, Elizabeth Heathcote, Moira B. M. Hendry, J. D. Hill, B. K. Hingorani, J. M. Hipkin, Stella Pak-Ngor Ho, J. D. S. Hodgson, Sylvia L. S. Hui, I. R. Jenkins, Kathleen R. King, Agnes Leslie, E. B. Longton, B. A. Lyder, D. B. McArthur, P. B. McComish, J. C. M. MacDonald, G. H. McMorland, D. I. Macnair, J. M. Manners, Anne Melvin, A. Nair, J. H. Nicholls, H. G. Nicol, D. McK. Norrie, Florence Y. Obadiah, F. N. Obiakpani, E. R. Perks, Joan I. Pitts, R. J. L. Potts, D. G. Price, Hazel M. Price, N. Rahaman, M. S. Rajagopalan, G. H. Rees, J. M. Reid, Blodwen E. J. Riding, Euphemia Rogers, A. O. Russell, Audrie M. Sanders, S. Sarin, M. Seideman, G. B. Smith, J. T. Spiller, Margaret Spink, Miriam Stafford, I. S. Sutherland, Audrey J. C. Symons, D. Talwar, G. W. Tamlyn, I. D. Thompson, P. J. Van Den Brul, M. G. Wagg, C. G. Waters, C. J. White, Y. P. A. Wiggishoff, Gladys M. H. Williams, Judy A. Wilson, D. A. Young, O. J. Zilliacus, J. S. M. Zorab, Humaira Zuberi.

DIPLOMA IN CHILD HEALTH.—S. P. Nanda.

DIPLOMA IN INDUSTRIAL HEALTH.—K. R. Bremner, H. A. Collins, W. G. Cooke, A. J. D'Souza, R. Gardiner, A. Gatherer, W. I. Glass, A. K. Gupta, J. G. D. Laing, J. E. Morris, R. R. Rao, R. Routledge, M. Stilon-de Piro, W. M. Sutcliffe, T. Taylor, P. P. Turner.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.—N. M. Al-Naib, H. A.-B. Alusi, J. P. Andrew, M. A. Chowdhary, N. C. Ghosh, S. K. Hazra, S. N. Lahiri, F. H. Lang, G. J. Lotter, V. S. Murty, K. S. Nuri, G. N. Prasad, Trakarn Sivaporn.

DIPLOMA IN MEDICAL RADIOTHERAPY.—P. J. M. van Miert.

DIPLOMA IN PATHOLOGY.—B. Boczarow, G. H. Roberts, A. R. Roy, Jessie L. Sharp, J. W. Whitelaw.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—M. S. Aldridge, Beryl G. Anscombe, G. A. Asghar, G. W. Ashcroft, T. Asuni, I. S. Berg, J. S. Bland, R. H. Cawley, J. Clarke, J. F. Cleobury, J. A. Docherty, T. L. Dunn, J. D. W. Fisher, R. H. Fox, A. I. M. Glen, B. G. Gradwell, J. A. Greeves, W. A. McL. Hall, M. A. Harper, J. R. Hood, J. S. Hughes, P. T. Huppert, Doreen Hutchinson, G. A. Ives, J. Johnson, V. G. Joshi, F. E. Kenyon, R. J. Kerry, L. C. Kreeger, Marjorie K. Le Vay, Evelyn B. Lind, D. E. Longden, G. P. McGovern, J. L. F. Maine, E. D. Myers, Paulette O'Dowda, E. G. Oram, H. Richardson, A. R. Robertson, J. M. Robertson, P. D. L. Roper, E. L. N. S. Sack, Y. Seneviratna, E. Serafetinidis, W. J. Stanley, M. T. Stather-Dunne, L. Steen, J. C. Stewart, Rose E. Toussaint, H. C. White, Meow Foo Yap.

DIPLOMA IN PUBLIC HEALTH.—A. Alakija, L. G. Couch, G. D. Forwell, Ruth E. Francis, J. Galea, Grace K. Gregory, M. Hamza, R. R. Japal, A. J. M. X. Kerrigan, A. Martin, Olga M. Morgan, R.-A. Pakdel, Marianne A. A. Silva, S. Sud, B. Teelock, Margaret N. A. Tew, A. H. Thomas, Marjorie E. Watts, A. S. M. Wilson.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—V. Sakarintara and Shujia-Ud-Din.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates, having completed the final examination, have been granted the diploma of L.M.S.S.A.: H. S. Dickson, E. B. Lewis, I. B. S. Karewal, G. J. M. Erwin, E. S. Dadabhay, D. M. Holmes, P. Havold-Arseth, A. Guest, R. Rogerson, R. A. M. Taylor, G. Stewart, M. C. O. Bax, K. A. H. Kubba, K. R. Bowles, S. G. I. Hamilton.

The following candidates have been awarded the Diploma in Industrial Health: A. B. Baillie-Hamilton, D. H. Ball, A. G. Berney, P. Blackledge, G. M. P. Boyes, T. Coates, J. L. Facer, F. Halliwell, J. W. Hill, J. E. L. Lahaise, D. C. Smith, J. H. Williams, A. P. Wright.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **August 15** (No. 32) and corresponding week 1958.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the whole of England and Wales (London included), London administrative county, the 11 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1959 Eng. & Wales	1959 Lond.	1959 Scot.	1959 N. Ire.	1959 Eire	1958 Eng. & Wales	1958 Lond.	1958 Scot.	1958 N. Ire.	1958 Eire
Diphtheria	3	0	2	1	2	3	0	3	0	
Dysentery	434	51	213	5	1	367	74	118	4	
Encephalitis, acute	8	0		0		1	0		0	
Enteric fever:										
Typhoid	3	1	0	4	3	4	0	2	0	2
Paratyphoid	10	3	5(B)	0	2(B)	5	2	2(B)	0	
Food-poisoning	340	39	30	2		171	20	8	2	
Infective enteritis or diarrhoea under 2 years				9	49				5	36
Measles*	4,036	113	68	59	39	5,578	318	21	6	43
Meningococcal infection	8	1	13	0		11	1	6	2	
Ophthalmia neonatorum	15	3	3	0		21	1	4	0	
Pneumonia†	137	12	113	1		150	14	80	3	
Poliomyelitis, acute:										
Paralytic	27	7	2	1	2	51	0	20	2	7
Non-paralytic	17	2	2			22	0			
Puerperal fever§	200	32	11	1		186	17	9	1	
Scarlet fever	364	24	64	9	15	410	26	31	4	18
Tuberculosis:										
Respiratory	424	63	66	25		427	46	84	10	
Non-respiratory	57	8	19	13		72	9	11	2	
Whooping-cough	798	23	96	5	79	607	33	59	38	14

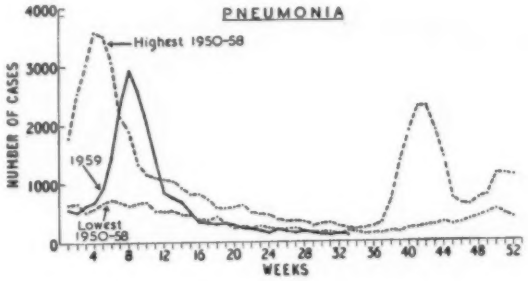
DEATHS	1959 Eng. & Wales	1959 Lond.	1959 Scot.	1959 N. Ire.	1959 Eire	1958 Eng. & Wales	1958 Lond.	1958 Scot.	1958 N. Ire.	1958 Eire
Diphtheria	0	0	0	0	1	0	0	0	0	0
Dysentery	0	0		0		1	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		1	0	0	0	
Infective enteritis or diarrhoea under 2 years	1	0	4	0	0	6	0	0	1	1
Influenza	7	0	1	0	0	6	0	0	0	0
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		0	0				0	0		
Pneumonia	295	16	14	12	6	288	21	11	15	2
Poliomyelitis, acute	1	1		0	0	5	0		0	0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	60	4	3	1	2	62	7	7	1	0
Non-respiratory		2	1	0	0		1	0	1	1
Whooping-cough	0	0	0	0	0	1	0	0	0	0
Deaths 0–1 year	245	20	20	10	8	242	31	23	11	10
Deaths (excluding stillbirths)	7,788	579	445	113	133	7,673	675	447	101	112
LIVE BIRTHS	14,943	1192	924	275	414	12,465	1032	912	197	328
STILLBIRTHS	324	17	27			268	20	26		

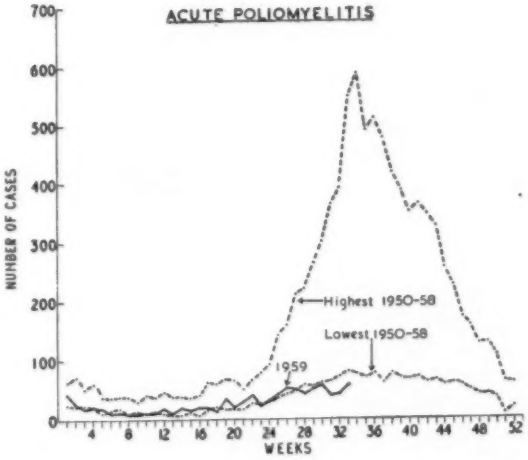
* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

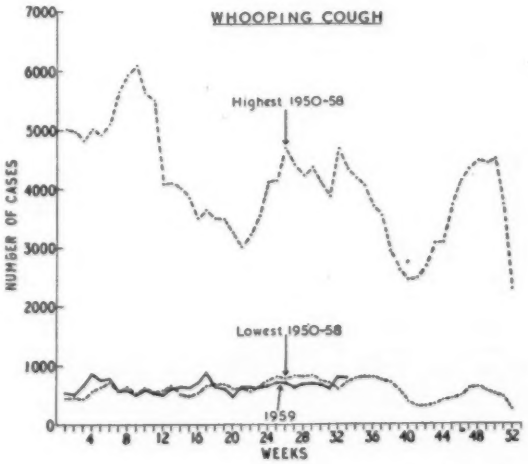
Vital Statistics

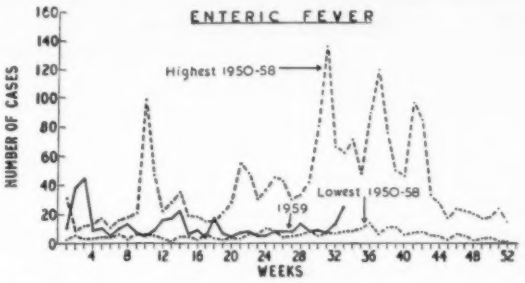
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1950–8 are shown thus ------, the figures for 1959 thus ———. Except for the curves showing notifications in 1959, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Week Ending August 22

Infectious Diseases

Areas where numbers of notifications were high in the latest two weeks for which figures are available

	Week Ending Aug. 15	Week Ending Aug. 22
Dysentery		
London	51	47
Warwickshire	22	37
Birmingham C.B.	12	11
Coventry C.B.	9	19
Yorkshire East Riding	41	28
Kingston-upon-Hull C.B.	16	16
Haltemprice U.D.	24	12
Yorkshire West Riding	39	43
Leeds C.B.	8	20
Glasgow	135	123
Acute Poliomyelitis		
Essex	4	4
Hampshire	1	10
Southampton C.B.	1	3
Eastleigh M.B.	0	4
London	9	15
Islington	3	5
Middlesex	4	4
Lancashire	7	1
Food-poisoning		
Lancashire	76	60
Blackpool C.B.	21	20
Paratyphoid Fever		
Lancashire	4	9
Bolton C.B.	0	5
Typhoid Fever		
Belfast C.B.	0	6
Co. Antrim	0	10
Co. Armagh	0	2
Co. Down	1	2
Co. Londonderry	3	1
Co. Tyrone	0	2
London	1	3
Hampstead	0	1
Lambeth	0	1
Lewisham	0	1
Stepney	1	0
Acute Infective Encephalitis		
Durham	1	2
Gateshead	1	2

Typhoid in N. Ireland

In the last few weeks an outbreak of typhoid has occurred on the north coast of Co. Londonderry. 26 confirmed cases from this source had been reported at the time of going to press, 23 being notified in the week ending August 22. The outbreak is centred on a holiday caravan site at Ballyreagh, between Portrush and Portstewart.

Medical News

B.M.A. Prizes, 1960.—Entries are invited for the following Association prizes. The closing date for the first four is December 31, 1959:

Nathaniel Bishop Harman Prize (£100) for research in hospital practice, open to any registered medical practitioner on the staff of a hospital in Great Britain or Northern Ireland who is not a member of the staff of a recognized undergraduate or post-graduate medical school. *Prize Essay Competition for Medical Students* (prizes of £25), open to any medical student who is a registered member of a medical school in the United Kingdom, Commonwealth, and Empire, or the Republic of Ireland at the time of submission of the essay. *Sir Charles Hastings* (£75) and *Charles Oliver Hawthorne Clinical* (£50) prizes for the promotion of systematic observation, research, and record in general practice, open to any member of the Association engaged in general practice. *Prize Essay Competition for Provisionally Registered Practitioners* (£50), open to any provisionally registered practitioner in the pre-registration year at the time of submission of the essays. *Brackenbury Prize* (£100), "The Problem of the Ageing Population." By January 31, 1960.

Details of all prizes from the Secretary, B.M.A. House, Tavistock Square, London, W.C.1. Preliminary notice of entry is required for all prizes except the Nathaniel Bishop Harman Prize.

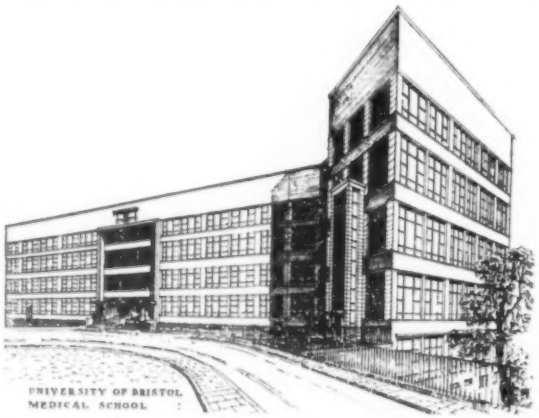
M.R.C. Travelling Fellowships, 1960–1.—Applications are invited for the following travelling fellowships and scholarships available for award or nomination through the Medical Research Council for the academic year 1960–1: (1) Rockefeller Travelling Fellowships, (2) United States Public Health Service Fellowships, (3) Lilly Foreign Fellowships, (4) Lederle Travelling Fellowship, (5) Dorothy Temple Cross Research Fellowships in Tuberculosis, (6) Alexander Pigott Wernher Memorial Travelling Fellowships in Ophthalmology and Otology, (7) French Exchange Scholarships in Medical Science.

All these awards are open to medically qualified candidates (and also to science graduates in the case of (1), (2), and (7)) who must be resident in the United Kingdom, should have had some training in research in a medical or surgical specialty, or in medical science, and should intend to return to this country to resume or take up new appointments in university or hospital teaching or in academic research. Fellowships held in the United States provide annual maintenance allowances varying from $3,000 to $5,100 according to domestic circumstances (50,000 to 70,000 fr. monthly with additional sterling marriage allowance in the case of French Exchange Scholarships), and travelling expenses are also supplied.

Details and application forms may be obtained from the Secretary, Medical Research Council, 38, Old Queen Street, Westminster, London, S.W.1. The closing date for applications is October 31.

Ciba Foundation.—Ten years ago the Swiss firm, Ciba Ltd., of Basle, set up the Ciba Foundation, attractively accommodated in an Adam house in Portland Square, to promote international co-operation in medical and chemical research. An account has now been given of the first decade of the Foundation's work under its director and secretary to the executive council Dr. G. E. W. WOLSTENHOLME (*Ciba Foundation Ten-Year Report for 1949–59*). Being established under British trust law, the Trust is completely independent in practice and policy. Its chief activity is the organization of small international conferences and other scientific meetings, and the publication of certain of the proceedings. Chief among these have been the Ciba Foundation Colloquia on ageing and endocrinology, and symposia on varied topics; 56 of these meetings have now been held. Of the Foundation's smaller meetings the evening discussions have been the most consistently successful. The founder's hope that the Foundation might become an international rendezvous has been so well realized that some 6,000 visitors representing 55 different countries have stayed at the Foundation during the last 10 years.

Bristol's New Medical School.—Work on the first stage of the new £1,200,000 medical school will start this month, and it should be ready for occupation in time for the academic year 1962–3. This stage covers the departments of pharmacology, experimental and chemical physiology, histology, and anatomy, shown in the artist's illustration.



The school is part of the University's general development plan to provide for an additional 2,000 students in five years, and will include conference rooms, library space, and facilities for studying radioactive substances, and for co-operation with veterinary teaching. In keeping with the new Queen's Building, the medical school will be faced with bricks and Bath-stone dressings. As the site slopes steeply, four of the eight floors will be below ground level and the main entrance will be on the fourth floor.

"Biologia Neonatorum."—The journal *Neo-Natal Studies* has been rechristened *Biologia Neonatorum* from the January, 1959, issue. The change marks editorial recognition of the growing interest in neonatal and foetal medicine, and a desire to establish the journal on an international basis. The editor is Dr. A. MINKOWSKI (Paris) and British members of the international editorial board are Professor R. A. MCCANCE, F.R.S., Professor A. MONCRIEFF, and Professor J. WALKER. The journal will be published quarterly, and contributions, which may be written in English, French, or German, and must include a summary in the original language, should be sent to Dr. A. MINKOWSKI, International Children's Centre, Château de Longchamp, Bois de Boulogne, Paris, 16, France. Subscriptions (Sw. Fr. 25 or $6) to the publishers, S. Karger, Ltd., 25, Arnold-Böcklin-Strasse, Basel, Switzerland.

Royal College of Physicians (Edin.).—QUEEN ELIZABETH, the Queen Mother, who was elected an honorary Fellow of the College in 1953, has been graciously pleased to accept the invitation of the President, Dr. A. RAE GILCHRIST, and Fellows to dine privately in the Hall of the College on Saturday, November 7, 1959. Thereafter, in a brief ceremony, Her Majesty will sign the Roll of Fellows and have the Fellowship conferred.

Aberdeen University.—Mr. J. KYLE, at present lecturer in surgery, University of Liverpool, has been appointed senior lecturer from October 1. Dr. H. R. WORTH is to be medical officer of the Student Health Service.

London University.—Mr. H. C. KILLEY has been appointed to the University chair of oral surgery tenable at the Institute of Dental Surgery.

Welsh National School of Medicine.—Dr. O. P. GRAY, formerly assistant to the director, department of child health, Guy's Hospital, London, has been appointed senior lecturer in child health at the School.

Society of Apothecaries.—The following officers have been elected for the ensuing year: Dr. R. R. TRAIL (Master),

Dr. CHARLES WHITE (Senior Warden), and Mr. A. M. A. MOORE (Junior Warden).

Central Council for Health Education.—Dr. D. J. GORDON-SMITH has been appointed deputy medical director to the council with effect from July 21.

"Life-savers."—On August 25 Bristol Customs Officers found Indian hemp with a black market value estimated at £35,000 hidden in a life-saving raft on the s.s. *Salween*. An even bigger haul worth £150,000 was discovered earlier in the month at Liverpool on a sister ship of the *Salween*, the s.s. *Yoma*. Both ships had arrived from Rangoon.

Multiple-Sclerosis Society.—The Society has made grants for research into multiple sclerosis and allied nervous diseases to Newcastle Royal Infirmary (£9,500), the University of Leeds (£8,100), and the University of Manchester (£1,000).

Car Number A1.—The first British car registration number A 1, has been sold by its owner for £2,500. He has given the proceeds to the Guide Dogs for the Blind Association (*The Times*, August 26).

COMING EVENTS

"Mutations, Immunity, Mortality."—Sir Macfarlane BURNET, O.M., F.R.S., discusses the clonal selection theory of acquired immunity with a physician. Third Programme, September 5, 9.35 p.m.

Institute of Diseases of Chest.—Clinical demonstrations, free to medical practitioners, will be continued during September at 5 p.m. on Fridays at the Institute's lecture room (Brompton Hospital, Fulham Road, S.W.3).

Institute of Neurology.—September 10, 5.30 p.m., "Plasticity Changes in the Nervous System." Professor Sir JOHN ECCLES, F.R.S. (Australian National University, Canberra). National Hospital, Queen Square, London, W.C.1.

"Chronic Bronchitis."—Symposium September 27, 9.45 a.m., Lecture Hall, Ashludie Chest Hospital, Monifieth, Dundee. Tickets (10s.), including sherry and buffet luncheon, from the Chest and Heart Association, 65, Castle Street, Edinburgh, 2.

No. 22 General Hospital, R.A.M.C. 1939–1945.—10th Reunion Dinner, Stork Hotel, Liverpool, September 26. Details and tickets from Mr. C. COOKE (Secretary), 17, Greenhill Avenue, Liverpool, 18.

Glyndebourne Concert.—By courtesy of Mr. JOHN CHRISTIE, the Hellingly Hospital League of Friends are sponsoring the London Mozart Players, and the soloist, NINA MILKINA, in a concert of music by Mozart and Schubert at 3 p.m., September 27. Seats are bookable through Horace Jacksons, Lewes. Southdown buses will run from Lewes station.

Institute of Biology.—Symposium on "Biological Problems Arising from Control of Pests and Diseases," October 1 and 2, Lecture Hall, Royal Geographical Society, Kensington Gore, London, S.W.7. Details from the Institute, 41, Queen's Gate, London, S.W.7 (KNI 7339).

"Nutrition and the Eye."—Nutrition Society symposium at Guy's Hospital Medical School, St. Thomas's Street, London, S.E.1, 10.30 a.m., October 10. Details from Miss D. F. HOLLINGSWORTH, c/o Ministry of Agriculture, Fisheries and Food, Great Westminster House, Horseferry Road, London, S.W.1.

R.A.F. Medical Branch Dinner, Royal College of Surgeons, October 16. Details from Air Ministry (M.A.3), 1–6, Tavistock Square, London, W.C.1.

Postgraduate Medical School.—A course of 10 lectures and demonstrations for postgraduate students on "Radio-isotopes in Clinical Medicine and Research" will be given by Dr. E. H. BELCHER in the Upper Lecture Theatre on Tuesday afternoons at 4 p.m., beginning October 13.

A course of six lectures for postgraduate students on "Biological Effects of Radiation" will be given in the same theatre on Thursday afternoons at 4 p.m., beginning November 5, by Dr. T. ALPER, Dr. M. EBERT, and Dr. R. H. TOMLINSON, all of the M.R.C. Experimental Radiopathology Research Unit.

Royal Institute of Public Health and Hygiene.—The Bengue Memorial Award Lecturer for 1959, Dr. DENIS HILL, will speak on "The Role of Psychiatry in Medicine," October 12, 4 p.m., at the Lecture Hall of the Institute, 28, Portland Place, London, W.1.

57th French Oto-Rhino-Laryngological Congress.—October 19–22, Grand Amphithéâtre de la Faculté de Médecine, Rue de l'Ecole de Médecine, Paris. Details from the Secretary-General, Dr. H. GUILLON, 6, Avenue Mac Mahon, Paris, 17.

32nd French Medical Congress.—Lausanne, October 8–10. Details from Professor P. DELORE, Secrétaire-Général, 13, Rue Jarente, Lyon (Rhône), France.

6th International Congress of Therapeutics.—October 14–15, Strasbourg. Details from Professor F. SCHMID, Institut de Pharmacologie, Hôpital Civil, 1, Place de l'Hôpital, Strasbourg, France.

Royal Medical Benevolent Fund.—Annual general meeting, September 30, 5 p.m., at the Medical Society of London, 11, Chandos Street, London, W.1.

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The Journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Industrial Medicine.—Issued quarterly (£3 annually). The new issue (Vol. 16, No. 3) includes:

OCCUPATIONAL LUNG CANCER: A REVIEW. Richard Doll.
BIOCHEMICAL STUDIES ON THE TOXICITY OF TETRAETHYL LEAD AND OTHER ORGANO-LEAD COMPOUNDS. Jill E. Cremer.
DERMATITIS IN THE SOUTH WALES MINING INDUSTRY: A REPORT OF A SURVEY OF TWO COLLIERIES. Bryan F. Matthews.
ACCIDENTS IN A NAVAL DOCKYARD. C. P. Collins.
THE ACUTE TOXIC EFFECTS OF BLACK SMOKE. R. E. Pattle, G. D. Wedd, and F. Burgess.
SOME HAZARDS IN THE MANUFACTURE AND USE OF PLASTICS. D. Kenwin Harris.
PATTERNS OF SICKNESS ABSENCE IN A RAILWAY POPULATION. Cecil Gordon, A. R. Emerson, and Derek S. Pugh.
THE ACTION BY CERTAIN PNEUMOCONIOTIC FACTORS UPON THE ACID MUCOPOLYSACCHARIDE CONTENTS OF PULMONARY MACROPHAGES. N. Gh. Lupu, Doina Velican, C. Velican, and V. Olinescu.
MISCELLANEA:
A CASE OF CIRRHOSIS AND PRIMARY CARCINOMA OF THE LIVER IN CHRONIC INDUSTRIAL ARSENICAL INTOXICATIONS. S. S. Jhaveri.
BOOK REVIEWS.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Englander.—On July 28, 1959, in Buffalo, N.Y., U.S.A., to Lenore (formerly Simpson), D.M., wife of Harlan Englander, a son—John Clifford.
Kustow.—On July 21, 1959, at the Middlesex Hospital, London, W., to Ann, wife of Bernard Kustow, M.B., B.S., a sister for Miriam and Daniel—Naomi.
Reynolds.—On August 20, 1959, at Brighton General Hospital, to Patricia (formerly Aldridge, M.C.S.P.), wife of Patrick Reynolds, M.B., B.S., a brother for Christine Anne—David Charles.
Sinton.—On July 19, 1959, at Taunton, Somerset, to Betty, wife of Robertson Sinton, M.D., M.R.C.P., a daughter—Fiona Elizabeth Robertson.

MARRIAGES

Thomas-Rendell.—On August 18, 1959, Dr. G. N. J. Thomas to Dr. Christine Rendell.

DEATHS

Cunningham.—On July 1, 1959, at Morecambe Hospital, Arthur John Wellington Cunningham, M.D., D.P.H., of Haversham, Westmorland.
Dunner.—On June 6, 1959, Lasar Dunner, M.D.
McCluskey.—On July 1, 1959, in an infirmary, Glasgow, Herbert McCluskey, M.B., Ch.B., of 33, Cleveden Road, Glasgow.
MacKenzie.—On July 3, 1959, James MacKenzie, M.D., of "Glengarth," St. Annes-on-Sea, Lancs.
Pick.—On July 3, 1959, Surgeon Rear-Admiral Bryan Pickering Pick, C.B.E., M.R.C.S.
Richards.—On July 3, 1959, at Southend Cottage, Ditchling, Sussex, David Harold Richards, M.R.C.S., aged 81.
Whalley.—On July 3, 1959, in hospital, Samuel Whalley, M.B., Ch.B., of 95, East Road, Longsight, Manchester.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Spasmodic Torticollis

Q.—*What are the current views on the aetiology and treatment of spasmodic torticollis?*

A.—There is considerable deficiency in knowledge of the aetiology of spasmodic torticollis. In some cases the condition is hysterical and may respond to psychotherapy, in others the torticollis may be part of a more generalized extrapyramidal disorder such as post-encephalitic Parkinsonism. It is in the cases of isolated spasmodic torticollis which do not appear to be hysterical that difficulty arises. It is probable, but not proved, that these cases are due to an extrapyramidal lesion, and in a few of them other involuntary movements may occur at a later date. Treatment is unsatisfactory, drugs and physiotherapy usually being largely ineffective. In severe cases surgical measures may be carried out, the most effective being the major procedure of bilateral division of the anterior roots of the upper three cervical nerves and the spinal accessory fibres, although even after this operation some involuntary movement may persist.

Allergy to Plastic Dentures

Q.—*A patient cannot tolerate modern plastic dentures. They cause burning in the mouth, indigestion, and a good deal of general malaise. The plastic used in 1935 did not have this effect. What can be done about it?*

A.—The symptoms listed are consistent with an allergy to the denture material, but one would expect to see accompanying signs of local irritation. Allergy to the modern plastic, methyl methacrylate, is extremely rare but has been recorded, and this material was not in general use in 1935 although it had been introduced a year or two before. The 1935 denture was probably made of phenol formaldehyde resin or one of the other experimental plastics which have since been discarded. These symptoms are also met with among denture-wearing women of menopausal age, when they are usually accompanied by some abnormality in adrenocortical function, or they may be the result of one of the anaemias, of diabetes, or of a vitamin deficiency. These and similar symptoms, frequently without any sign, are not uncommonly met with, and they are more common in females than in males, usually over 50 years of age, and often accompanied by some mild psychological disturbance. Dentures, of whatever material they may be made, are often the exciting cause, but successful treatment depends upon the accurate diagnosis and elimination of the basic cause.

Immunity to Poliomyelitis

Q.—*In a recent epidemic of poliomyelitis in Singapore young adults aged between 20 and 30 appeared to escape infection. They were about 15 years old when an outbreak of poliomyelitis occurred in 1948. Should they now be vaccinated or may they be regarded as generally immune?*

A.—Poliomyelitis is the result of infection with any one of at least three separate viruses which have been shown to be immunologically sharply defined and with little if any protective overlapping. Not only are second attacks theoretically possible, but a large number have been recorded, the two attacks being due to different types. The questioner implies that the age group, 20–30 years, which appears to escape poliomyelitis now, may have been infected (asymptomatically of course) and made immune by an epidemic of the disease 10 years previously. That may well be, and it would be interesting to find out whether or not the same type of virus was prevalent in both epidemics. No subject, however, can be regarded as "generally immune" unless he can be shown to possess antibodies to all three types of virus, a time-consuming investigation for a large number of individuals. They should be given trivalent poliomyelitis vaccine. This is being given now in Great Britain to all persons who have had poliomyelitis before, whether paralytic or non-paralytic.

Mental Effects of P.A.S.

Q.—*Does P.A.S. ever affect the mental capacity of patients who are receiving a course of it for tuberculosis?*

A.—There are no recorded cases of mental disturbance due to P.A.S. As it is now the invariable practice to give P.A.S. in conjunction with either streptomycin or isoniazid, any mental symptoms would almost certainly be due to one of these two drugs and not to the P.A.S. Many patients who are having streptomycin find concentration difficult and complain that the head feels "muzzy." I.N.H. can give very definite mental symptoms: patients complain of irritability, lack of concentration, and a feeling of unreality. With high dosage they may even become maniacal. These side-effects of I.N.H. can be relieved by the administration of pyridoxine, 20 to 100 mg. daily.

Split Lip

Q.—*What is the treatment for an intractable split in the lower lip? The split heals, but is continually broken open when talking or smiling.*

A.—It is probable that the chronic fissure in the lower lip has given rise to some fibrosis and that repeated cracking now takes place because of the resultant loss of elasticity. If this is so it should be possible to feel a persistent thickening of the tissues even after the fissure has temporarily healed. A treatment which may be successful is to excise a wedge of the lip so as to remove the fibrous cicatrix and to obtain first-intention healing without fibrosis.

Corrections.—The final paragraph of the letter from Dr. T. W. Lloyd on the subject of chemotherapy in tuberculosis (August 15, p. 192) should have begun: "I do not wish particularly to advocate the use of streptomycin and P.A.S. in any combination . . ." The word streptomycin was omitted in the letter as printed.

We regret an error in the letter from Drs. W. H. J. Baker and D. R. Christie on the subject of breast abscess (August 15, p. 192). In the third paragraph ". . . resistant strains of a variant phage type . . ." should have read ". . . resistant strains of a variety of phage types. . . ."

We regret that the note in "To-day's Drugs" on the anti-leprosy drug "etisul" stated it had been given orally as well as by inunction. It has been given only by inunction, whereas a closely related compound, sodium ethyl thiosulphate, has been given orally.

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